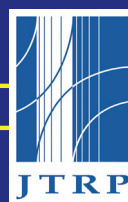


# 2012 Indiana Mobility Report

## Full Version



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# FOREWORD

Located at the crossroads of America, Indiana's highways are vital to our national transportation network and the Indiana economy. Over \$500 billion of freight moves from, to, or within the state on our highway system each year.

INDOT is committed to efficient management of our capital program and operations activities to deliver a high-quality surface transportation system at the lowest cost. In collaboration with our partners at Purdue University, we are integrating commercial probe vehicle data into INDOT processes to quantitatively manage our operations activities, shape our infrastructure investment priorities, and measure the impact of those investments. This report describes those activities and quantifies the progress we are making in improving Indiana mobility.

## Operations Impact

Travel time and travel time reliability are critical to our users. One of the case studies in this report demonstrates the impact of a traffic signal retiming project that improved both travel time and travel time reliability on US 31 in Kokomo. This report also documents the impact construction work zones and winter storms have on our system operation. The outcome-oriented performance measures described in this report allow us to make data-driven decisions to fine-tune our work zone management, Hoosier Helper deployments, and winter maintenance activities.

## Capital Program Impact

Indiana has aggressively invested in capital projects in recent years. Several of those were substantially completed in 2012. The mobility performance measures in this report provide new opportunities to improve how we prioritize competing capital projects. In fact, we can use these same measures to assess the impact after a capital project is completed or a new roadway operation strategy is implemented. The following pages of this report characterize the mobility of our highway system and the positive impacts of several recently completed capital projects.





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## INTRODUCTION

According to the Bureau of Transportation Statistics, Indiana has the fourth-highest number of vehicle miles traveled (VMT) per capita and the twelfth-highest total VMT among all US states. Indiana also serves several major national freight corridors. Each year, over \$500 billion of freight moves from, to, or within the state on the highway system.

In 2011, the Indiana Department of Transportation (INDOT) and Purdue University collaborated to develop the *2011 Indiana Interstate Mobility Report*. That report provided an objective framework, using commercial probe data, to quantitatively characterize the performance of Indiana's highway system. The 2012 report builds upon the 2011 report, expanding the scope to include selected arterials and improved performance measure graphics to identify both location and severity of congestion.

The performance measures in this report characterize the congestion on 943 centerline miles of Indiana Interstates 64, 65, 69, 70, 74, 94, and 465 (Figure 1), as well as the travel time characteristics of selected interstate commuter corridors (Figure 2) and selected arterials (Figure 3). This report explains the various performance measures and how to interpret them. The complete set of performance measures are contained in the following appendices:

- Appendix A: 2011 & 2012 Interstate Speed Profiles\*
- Appendix B: 2011 & 2012 Interstate Speed Profiles with Linear Distance Scale\*
- Appendix C: 2011 & 2012 Interstate Congestion Hours Summaries
- Appendix D: 2011 & 2012 Interstate Summary Statistics
- Appendix E: 2011 & 2012 Interstate Segment Congestion Rankings\*
- Appendix F: 2011 & 2012 Interstate and Arterial Corridor Travel Time Summaries\*
- Appendix G: Performance Measure Calculation Details\*

\*New in 2012.



Figure 1. Interstate map of Indiana. Dashed section of I-69 opened in November 2012.

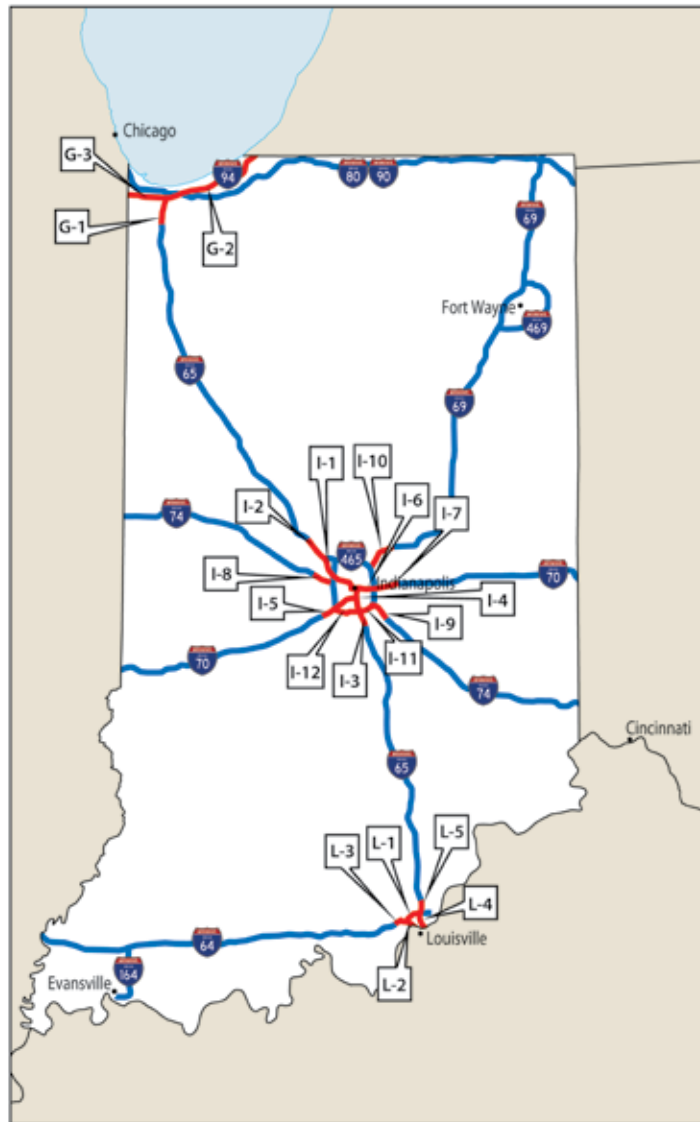


Figure 2. Interstate commuter corridors. (See Appendix F for detailed corridor information.)

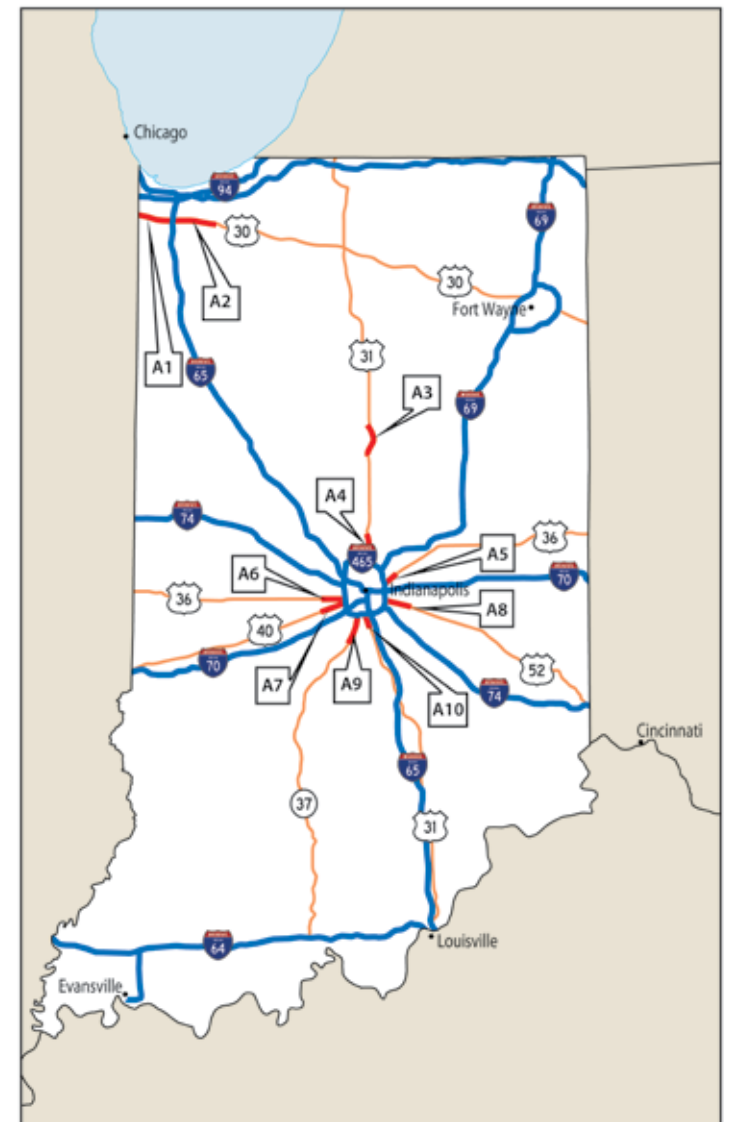


Figure 3. Arterial commuter corridors. (See Appendix F for detailed corridor information.)



## Crowd-Sourced Mobility Data

Commercial data providers such as INRIX (<http://www.inrix.com/>) collect probe data speed records from vehicle telematics, mobile phones, and GPS devices to provide real-time traffic condition maps such as those shown in Figure 4. This example illustrates how congestion queuing in advance of a construction zone (Figure 5) can be observed in probe vehicle data. These maps are based on a collection of road segments with breakpoints at exit ramps and entrance ramps, as well as other significant geometric features. Each segment has a unique segment ID, length, and location. In 2012, there were almost 2 billion minute-by-minute anonymous segment speeds collected along Indiana roadways. Analyzing this anonymous segment speed data provides the ability to compute mobility measures to characterize the performance of selected Indiana interstates and arterials. These performance measures can be used to identify factors that influence congestion in Indiana.

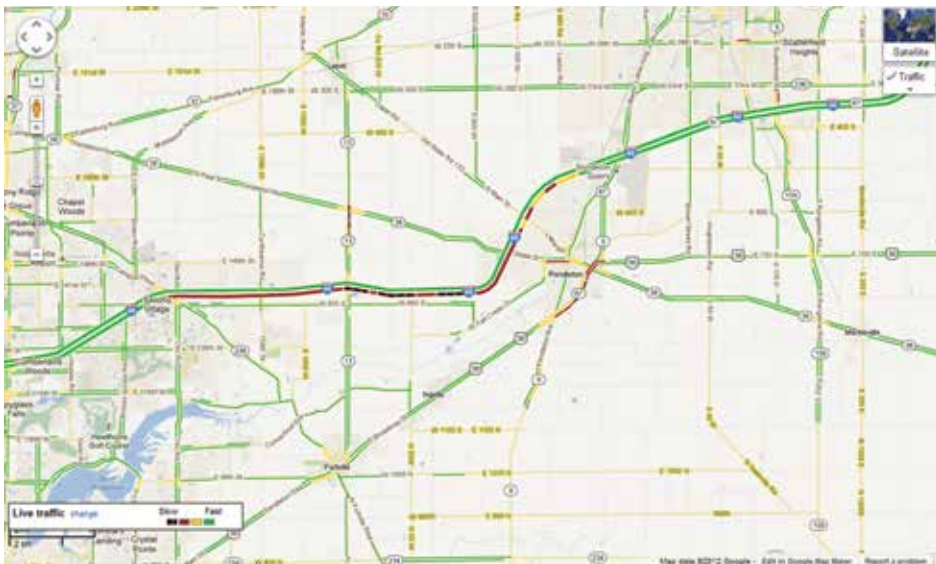


Figure 4. View of congestion on I-69.



Figure 5. Northbound traffic on I-69 in the congested region shown in Figure 4.

Performance Measure	Definition
<b>Congestion hours</b>	The number of hours during which an interstate segment or series of segments has an average speed of less than 45 mph. This binary performance measure provides performance measure graphics for identifying locations along the interstate with substantial congestion.
<b>Distance-weighted congestion hours</b>	The number of congestion hours multiplied by the segment length in miles. This performance measure provides summary statistics for the interstate system.
<b>Congestion index</b>	The total number of congestion hours along an interstate divided by the total length of the interstate, yielding an average congestion hour per mile for the entire roadway.

**Table 1.** Definition of performance measures introduced in the *2011 Mobility Report*.

## FROM 2011 TO 2012: PROGRESS IN MOBILITY REPORTING Increasing Data

Because of the continuing proliferation of smart phones, GPS devices, and vehicle telematics, the quantity of crowd-sourced data in Indiana grew approximately 25% between 2011 and 2012. This increase in data provides an opportunity to improve the fidelity of the interstate highway mobility analysis and also to extend the scope to include selected arterials.

### Improved Performance Measures

In 2011, the primary performance measure used for characterizing interstate mobility was the number of congestion hours. This measure was based on a single threshold of 45 miles per hour (mph) to determine whether a road section was congested for a particular time period. This binary-valued assessment technique was used to measure the number of hours in which a facility operated below the 45 mph average threshold and is a useful system-level indicator of congestion hot spots and recurrence from month to month.

Over the past year, the research team extended the analysis and developed additional performance measures that indicate severity of congestion. Table 1 lists the performance measures introduced in the 2011 report and Table 2 lists the new performance measures introduced in this 2012 report. Calculation details are available in Appendix G.

## Integration of Small Segments

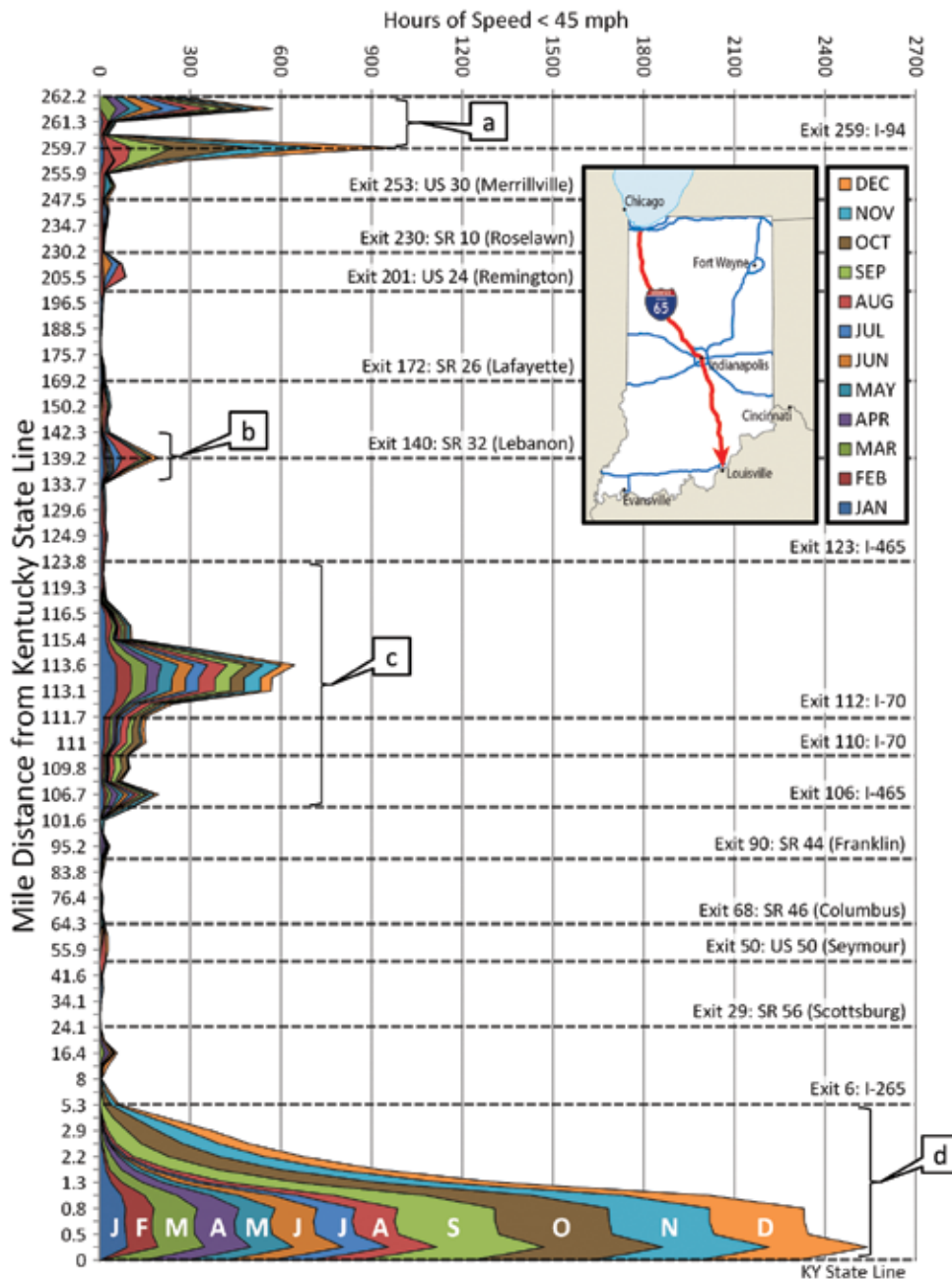
The 2011 report excluded very short segments from the analysis, such as those between interchange ramps. In this year's report these short segments are included in the analysis for completeness. Although they do not substantially impact the performance measures, the addition of these smaller interstate segments increases the fidelity of the data.

## Improved Data Analysis Resolution

In the *2011 Indiana Interstate Mobility Report*, data were aggregated in 1-hour increments. For this 2012 report, an improved approach using 15-minute increments was implemented. Figure 6 shows the number of congestion hours on southbound I-65 in 2011, computed using 1-hour increments, while Figure 7 shows the results using 15-minute increments. The locations of congestion are almost identical between the two graphs, as shown by the relative heights of the peaks, which change only slightly. For example, Figure 7 shows a slight increase in the observed congestion hours near mile marker (MM) 261, and a slight decrease near MM 0. This subtle change in the methodology does not change the overall characterization of congestion and its locations in Indiana's interstate highway system, but it does provide improved fidelity for estimating congestion severity and user cost.

Performance Measure	Definition
<b>Speed profile</b>	The number of congestion hours grouped by speed ranges. These performance measure graphics show both location and severity of congestion along interstate routes.
<b>Speed deficit</b>	The difference between the 45 mph congestion threshold and the actual observed speed. This is a quantitative performance measure that indexes the severity of congestion.
<b>Travel time deficit</b>	The number of hours of delay occurring in which speeds are below the 45 mph congestion threshold. This measure is useful for calculating the economic impact or user costs of congestion along a route.
<b>Congestion cost</b>	The estimated cost of congestion on a roadway, determined by computing the average delay for a section and multiplying it by the expected traffic volume and the value of time. The proportion of trucks is used to establish congestion costs for commuters and for commercial vehicles. A congestion cost is calculated on segments where the average speed falls 10 mph or more below the posted speed limit.

**Table 2.** Definition of performance measures introduced in the *2012 Mobility Report*.



## 2012 PERFORMANCE MEASURES

### Congestion Hours

Figures 7 and 8 show plots of congestion hours by segment for southbound I-65 for 2011 and 2012 respectively. Both plots show similar patches of congestion at MM 259.7 near Gary, around MM 139.2 in Lebanon, between MM 123 and MM 106 in the Indianapolis area, and south of MM 6 in the greater Louisville area. Both plots also show substantial decreases in the number of congestion hours in Indianapolis and Louisville, as well as increases in Lebanon and Gary. A slight increase in congestion hours around MM 55.9 can be observed in Figure 8, which corresponds to construction in that area in June 2012.

Figure 6 (this page). Congestion hours in 2011 by month, southbound I-65 (1-hour bins).

- a. Gary area.
- b. Lebanon area.
- c. Indianapolis area.
- d. Louisville area.

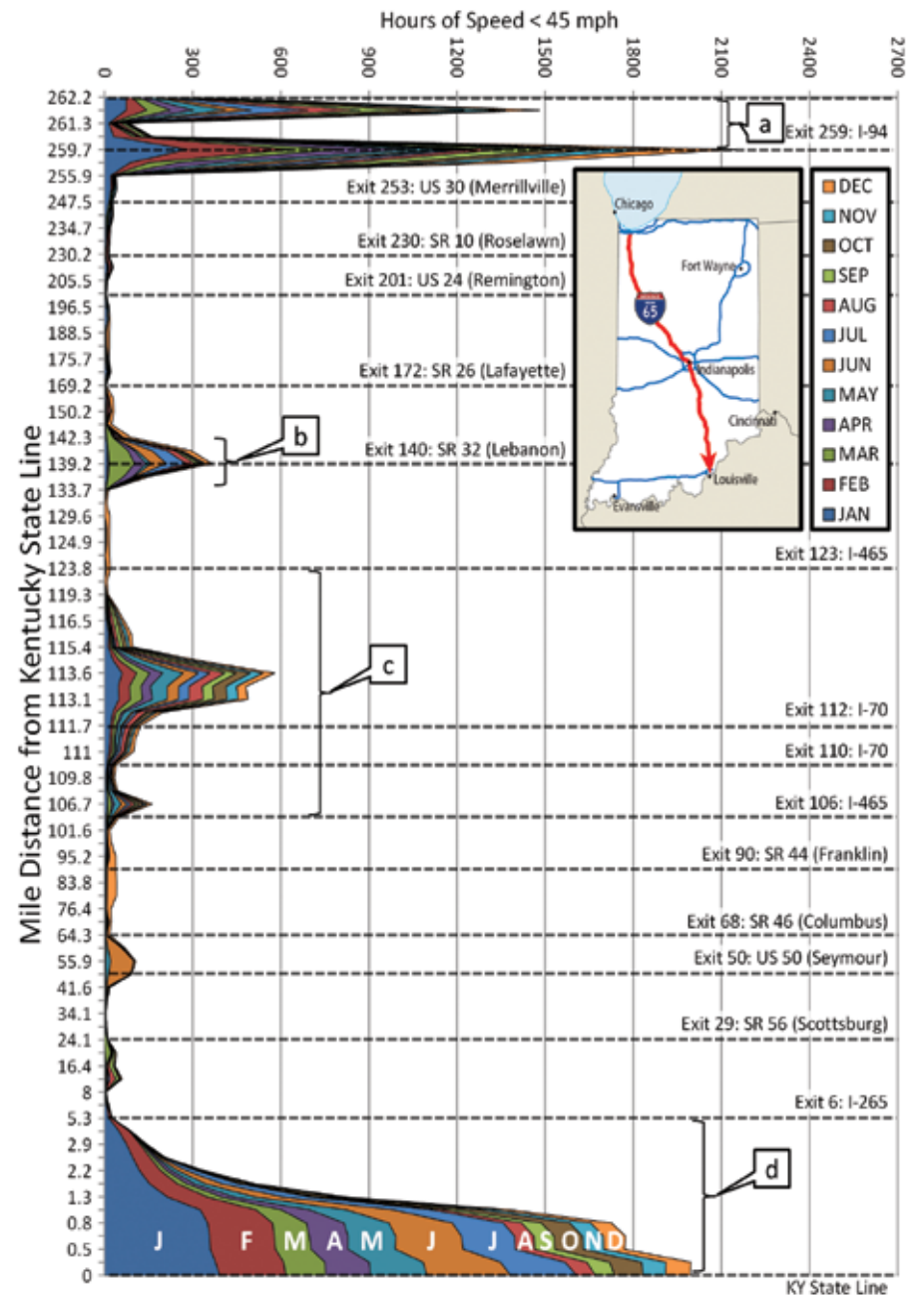
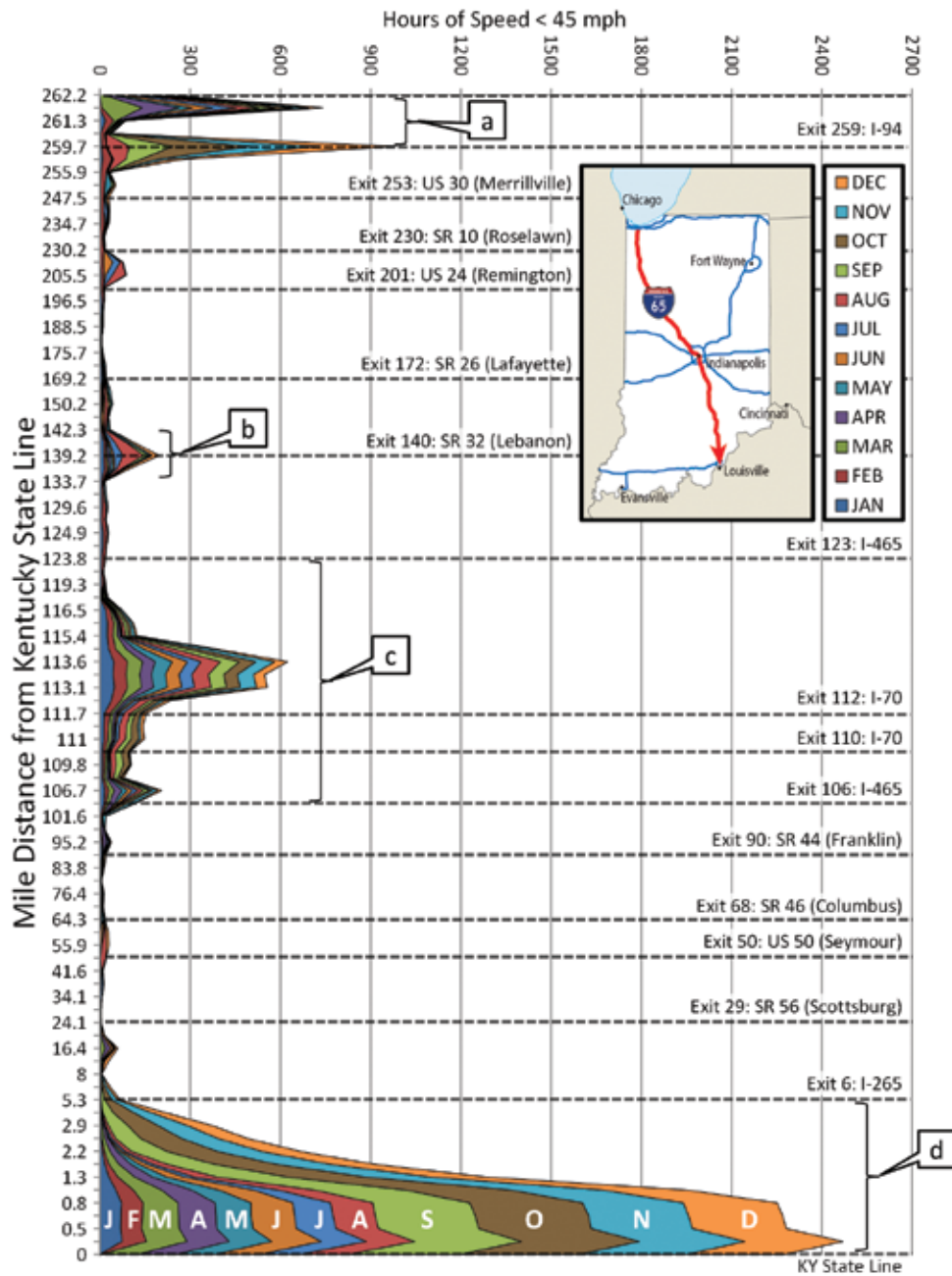
Figure 7 (page 7, left). Congestion hours in 2011 by month, southbound I-65 (15-minute bins).

- a. Gary area.
- b. Lebanon area.
- c. Indianapolis area.
- d. Louisville area.

Figure 8 (page 7, right). Congestion hours in 2012 by month, southbound I-65 (15-minute bins).

- a. Gary area.
- b. Lebanon area.
- c. Indianapolis area.
- d. Louisville area.





## Interstate Speed Profiles

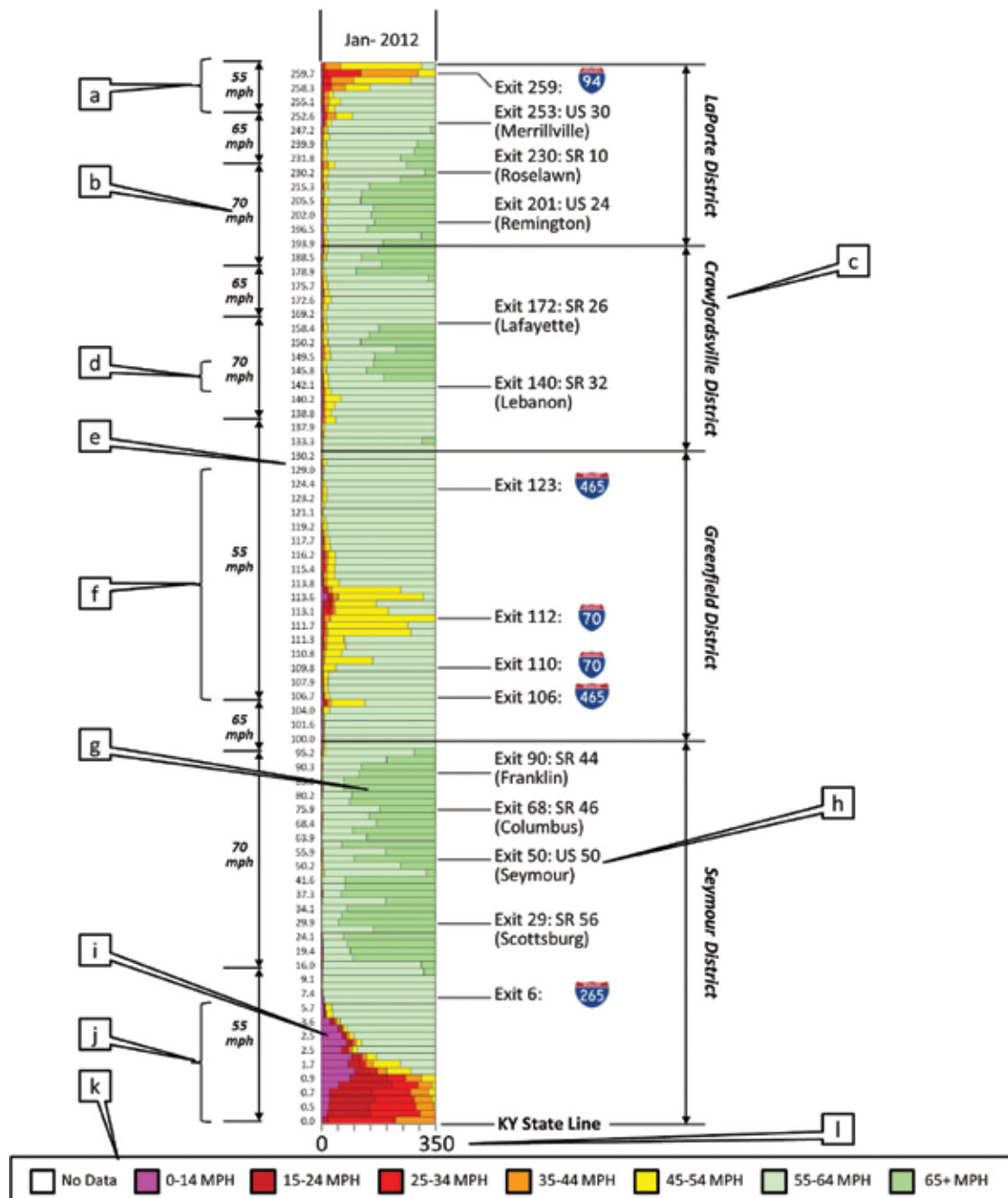
The congestion hour performance measure works well for a preliminary evaluation of a series of segments to identify locations of traffic congestion. However, the performance measure does not convey the severity of the congestion. This is because the binary 45 mph average threshold gives the same weighting to a segment that is operating at 44 mph as it does to a segment that is operating at 10 mph.

For the 2012 report, the speed profile was developed. Rather than showing only when average speeds fall below 45 mph, the speed profile groups speeds into different ranges. This makes it possible to identify locations with congestion, as well as the severity of congestion, by varying the color shading on the speed profile graph.

Figure 9 shows a speed profile for the month of January 2012 for southbound I-65. The color codes correspond to the number of hours the highway was operating in particular speed ranges. A typical month contains 672 to 744 hours, depending on the number of days. Because very few segments are congested 24 hours a day for months at a time, the time axis is truncated to 350 hours (Figure 9i) to facilitate viewing the distribution of hours with the slowest speeds. This provides the ability to quickly compare different locations or months by assessing the relative number of hours a highway segment may be operating substantially below its posted speed. Pink and red areas (Figure 9i) correspond to the most severe congestion.

Each segment is represented by its mile marker location along the primary y-axis (Figure 9e), providing a spatial representation of the segments. The speed profile also provides the posted speed limits (Figure 9b), locations of major interchanges (Figure 9h), and boundaries of INDOT districts (Figure 9c) and clearly shows the locations of major metropolitan areas (Louisville, Figure 9j, and Indianapolis, Figure 9f), as well as areas of construction, such as the Lebanon area (Figure 9d).

By repeating the January 2012 format shown in Figure 9 and applying it to the other 11 months, one can compare the congestion speed and speed range patterns from month to month (Figure 10). In this figure, the primary x-axis is repeated for each month. This view makes it easy to identify both recurring and nonrecurring congestion throughout the year.



The same data shown in Figure 10 can be plotted with a y-scale proportional to segment length, as shown in Figure 11. The primary x-axis in Figure 11 remains the same as in Figure 10. This makes it possible to differentiate between concentrated congestion in the Louisville (Figure 10a, Figure 11a) and Indianapolis (Figure 10b, Figure 11b) areas and congestion over longer stretches, such as between MM 50 and MM 65 (Figure 10c, Figure 11c) in June 2012, or between MM 60 and MM 100 in December 2012 (Figure 10d, Figure 11d).

Figure 9. Southbound I-65 speed profile, January 2012.

- a. Gary area.
- b. Demarcation of speed limits.
- c. Locations of INDOT district jurisdictions.
- d. Lebanon area.
- e. Mile markers of each segment.
- f. Indianapolis area.
- g. Example of low congestion (65+ mph).
- h. Locations of interchanges by exit/mile marker number.
- i. Example of high congestion (0-14 mph).
- j. Louisville area.
- k. Scale showing speed ranges.
- l. Maximum scale set to 350 hours per month.



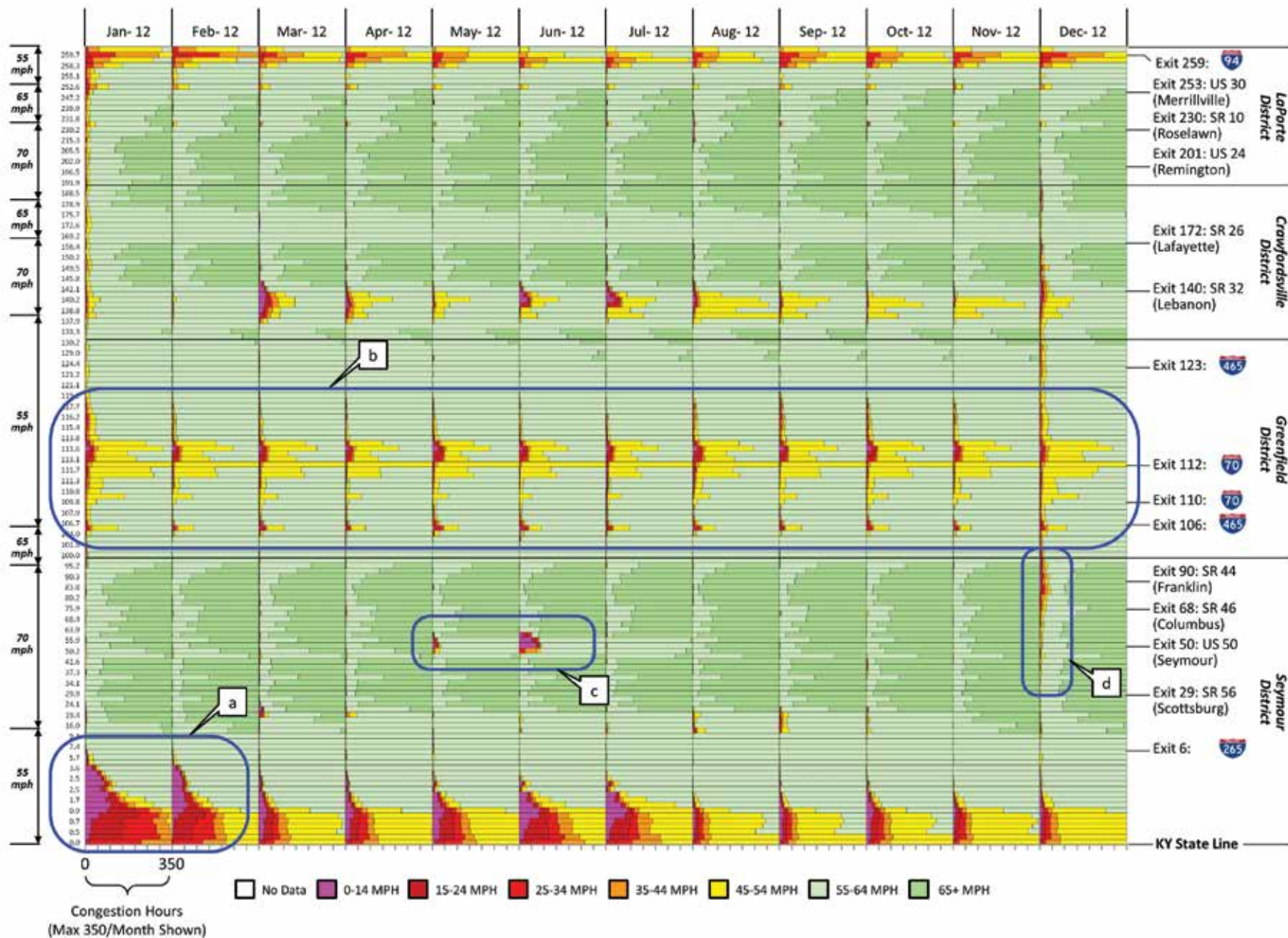


Figure 10. Southbound I-65 speed profile, 2012.

- Congestion in the Louisville area due to the closure of the I-64 Sherman Minton Bridge.
- Congestion in the Indianapolis area.
- Construction around MM 50.
- Impact of winter weather between MM 60 and MM 100.



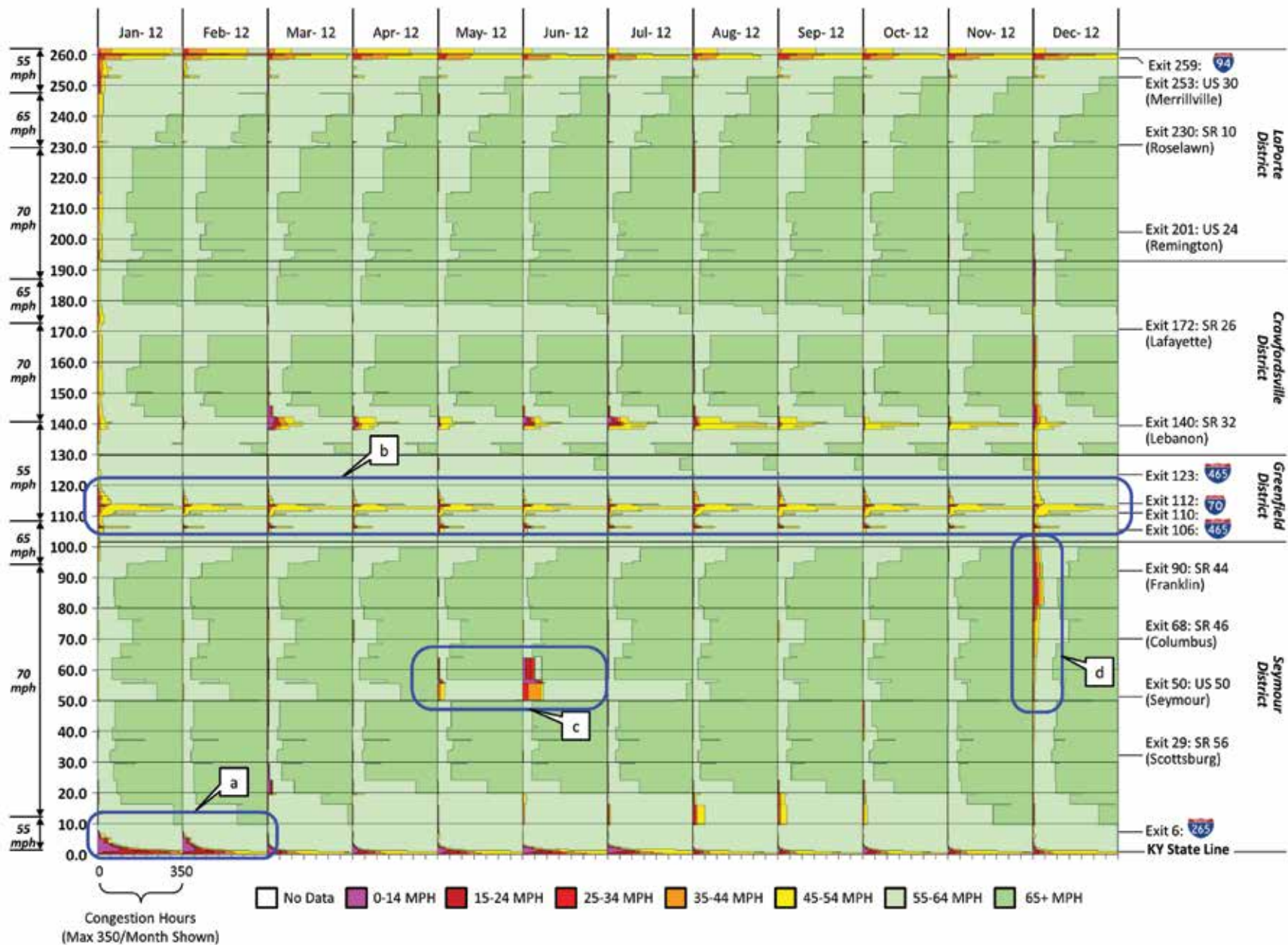


Figure 11. Southbound I-65 speed profile with linear distance scale, 2012.

- Congestion in the Louisville area due to the closure of the I-64 Sherman Minton Bridge.
- Congestion in the Indianapolis area.
- Construction around MM 50.
- Impact of winter weather between MM 60 and MM 100.

### Distance-Weighted Congestion Hours

The 2011 report introduced the concept of distance weighting (Table 1) to compute statistics summarizing the number of hours a corridor operated below 45 mph, weighted by distance. Figure 12 shows a graphic comparing I-65 monthly distance-weighted congestion hours in 2011 and 2012 for northbound (Figure 12a) and southbound (Figure 12b) directions. Distance-weighted congestion hours represent the number of hours during which speeds fell below the binary threshold of 45 mph, multiplied by the length of highway segment. Distance weighting reflects the influence of long highway lengths, but it does not consider the severity of speed reduction.

### Travel Time Deficit

This 2012 report introduces the concept of travel time deficit (Table 2). Travel time deficit takes speed reduction severity into account. While the congestion hour performance measures tend to identify localized congestion hot spots, travel time deficit focuses on those incidents or construction activities that significantly increase delay to travelers—whether it is a small decrease of speed on a long segment or a large decrease of speed on a short segment. This performance measure is summed over longer time periods to compare performance between segments. The units of travel time deficit are hours with reference to a time period (e.g., a month or a year). Figure 13 shows a graphic comparing I-65 monthly travel time deficit in 2011 and 2012 for northbound (Figure 13a) and southbound (Figure 13b) directions.

In general, Figures 12 and 13 bear many similarities. However, the differences between 2011 and 2012 for the months of August through December on southbound I-65 are considerable. Most notable is the month of November. There are approximately twice as many distance-weighted congestion hours in November 2011 as there are in November 2012 (Figure 12b), and the travel time deficit is nearly four times higher in November 2011 than in November 2012 (Figure 13b). This shows that not only was there a significant decrease in November congestion on I-65 in 2012, but also that the severity decreased.

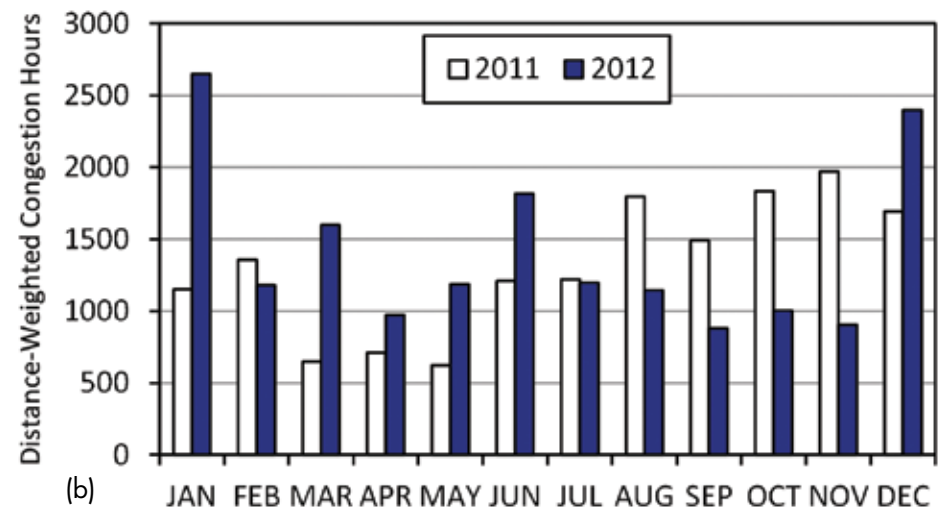
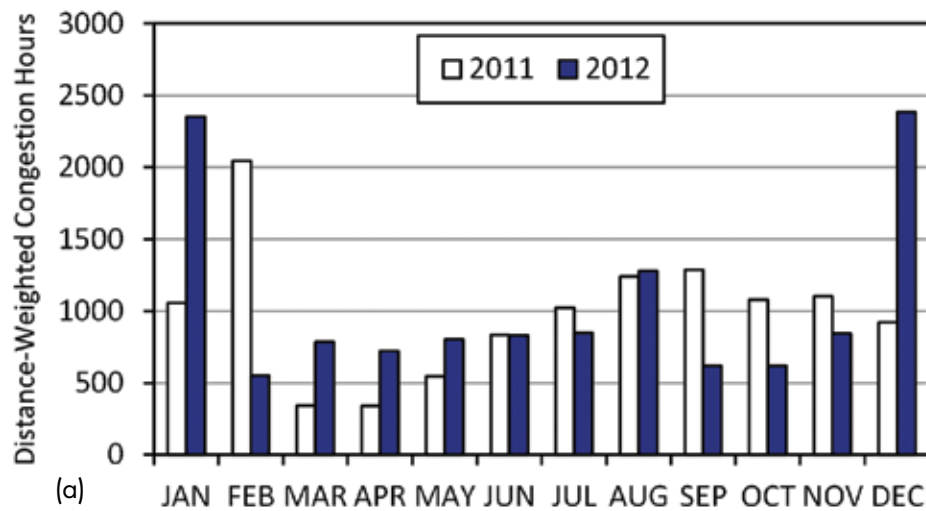


Figure 12. Distance-weighted congestion hour yearly comparison. (a) Northbound I-65. (b) Southbound I-65.

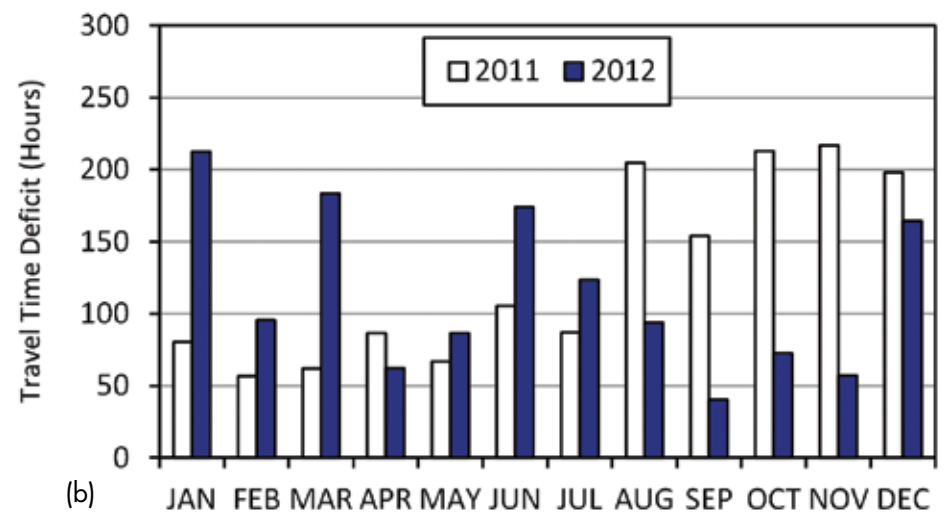
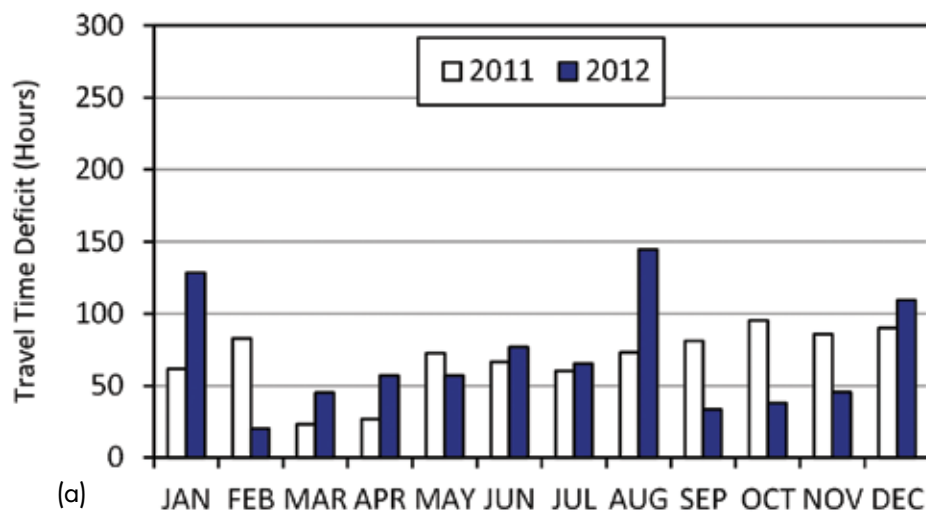


Figure 13. Travel time deficit yearly comparison. (a) Northbound I-65. (b) Southbound I-65.

## Summary of Indiana's Interstate Highway System Performance

The performance measure views presented in this report show the locations and severity of congestion in the year 2012. Overall, the interstate highway system in Indiana performed well, with most occurrences of significant congestion attributable to exceptional events such as construction and severe weather. Comparing the amounts of congestion between 2011 and 2012 is helpful for determining overall system performance as well as identifying locations of congestion.

## Comparison of 2011 and 2012 Interstate Performance

Figure 14 shows the distance-weighted congestion hours for 2011 and 2012 as side-by-side stacked monthly bar graphs, with the layers of the bars representing the contribution from each interstate highway. Figure 15 is organized similarly but shows the travel time deficit. This allows a comparison from one year to the next in total, by roadway and month. Distance-weighted congestion hours (Figure 14) indicate the total operating time of all the roadway segments spent in a congested state, while the travel time deficit (Figure 15) quantifies the impact of congestion on the travel times.

- In January 2012, I-65 had a very high level of congestion because of the closure of the I-64 Ohio River crossing (the Sherman Minton Bridge), which was not reopened until February; this accounts for the higher overall congestion hours and travel time deficit in January 2012 compared to January 2011.
- In February 2011, I-65, I-465, I-94, and I-69 had very high congestion levels because of a major winter storm that took place on February 1–2, 2011. The level of congestion in February 2012 was considerably lower, with less than half of both the congestion hours and travel time deficit measured for the previous year.
- March 2012 had higher congestion levels than March 2011, which is attributable to two events on I-65. In 2012, construction began on I-65 in the Lebanon area, and its impact was more severe in March than in the subsequent months. Also, on March 2–3 there was an ice storm in the Henryville area (MM 19), which caused speeds to drop to as low as 5 mph.



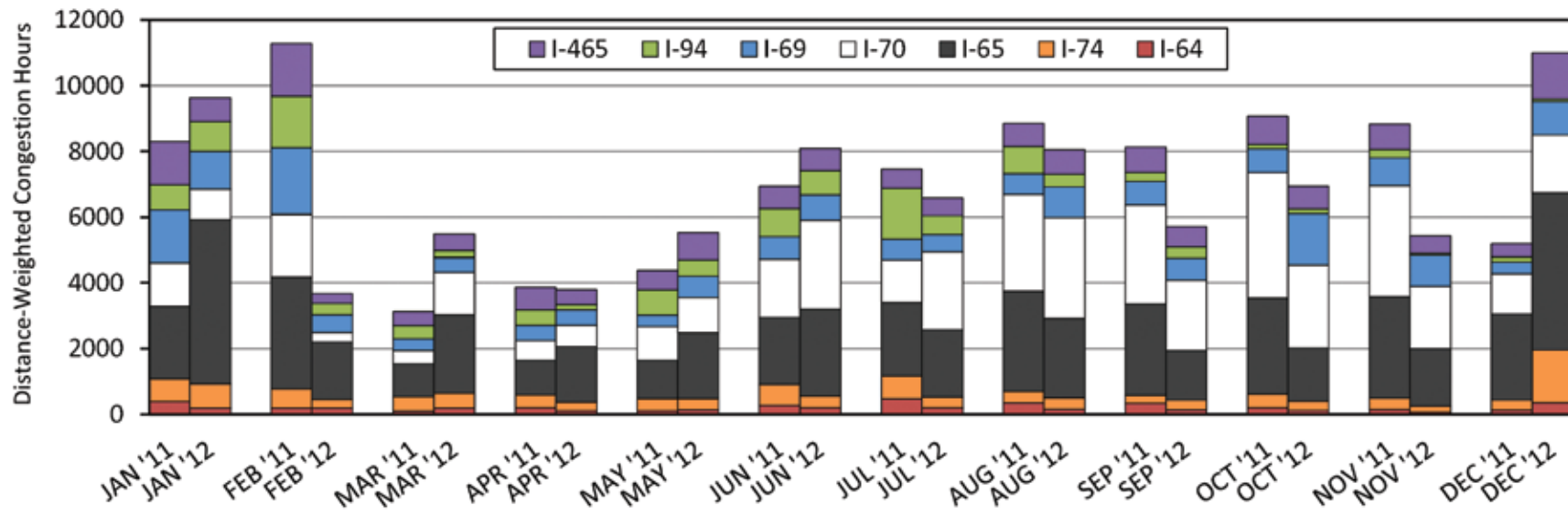


Figure 14. Distance-weighted congestion hour summary.

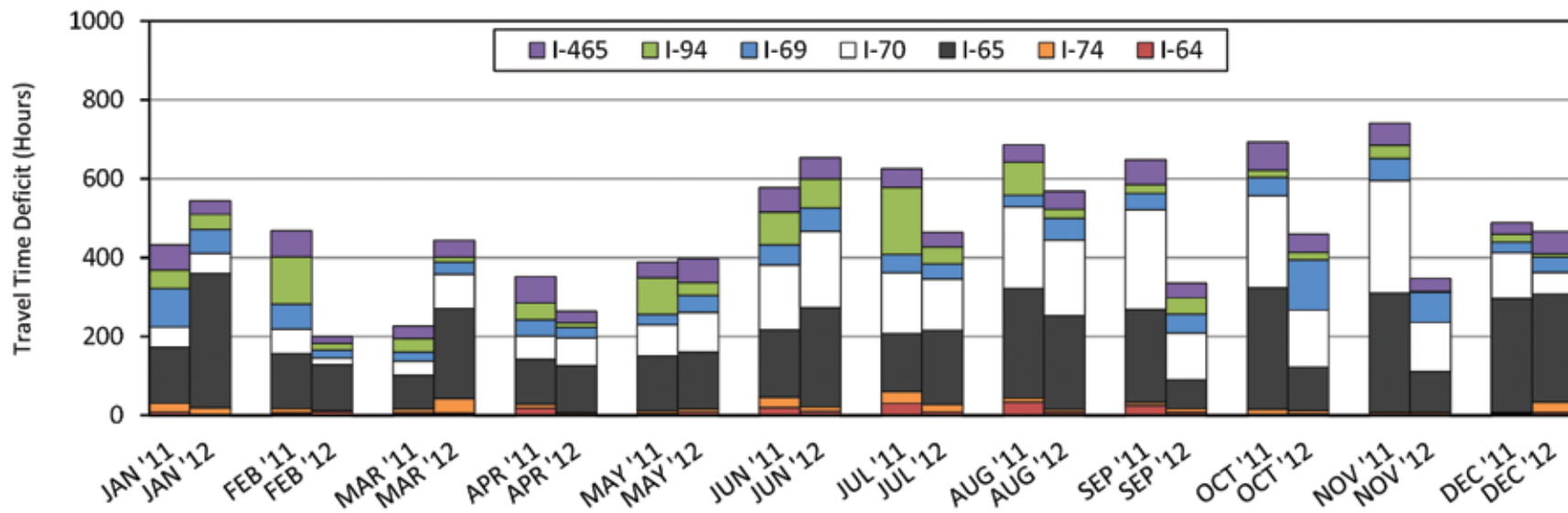


Figure 15. Interstate travel time deficit (TTD) summary.

- In April through August, overall congestion levels (total distance-weighted congestion hours and total travel time deficit) were very similar between 2011 and 2012. Construction projects on both I-465 and I-94 came to an end in these months, with new interchanges completed in the Accelerate 465 project and work zone restrictions lifted on the Borman Expressway (I-94). This led to decreases in congestion on those roadways. At the same time, there were increases in congestion on I-70 because of new construction projects occurring in 2012.
- In September through November of 2012, I-65 congestion levels were reduced. Much of the I-65 improvement is attributable to the opening of the Sherman Minton Bridge, which was closed during those months in 2011. I-70 congestion levels were also reduced in 2012. Construction took place on I-70 during both years, but its impact was lower in 2012. Amid these reductions, there was a substantial increase in congestion on I-69 in October 2012 attributable to lane closures for asphalt replacement.
- In December 2011, the Sherman Minton Bridge closure created substantial I-65 congestion, while in 2012 a major winter storm occurred in the Indianapolis area, leading to an increased number of distance-weighted congestion hours on I-65 and I-465. The 2012 travel time deficit did not see an increase because the overall distances affected by the storm were relatively short and the opening of the Sherman Minton Bridge in December 2012 offset some of that impact.

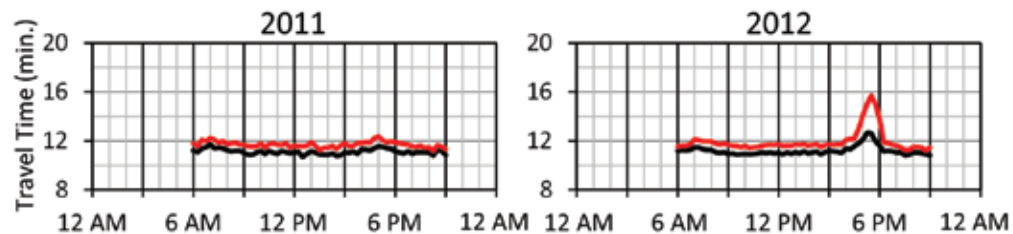
### Arterial Mobility Performance Measures

Measures of mobility for arterials have historically been challenging to obtain because of the impact of traffic control and the heterogeneous nature of entering and departing vehicles, as compared to interstates. The *2011 Indiana Interstate Mobility Report* did not include arterial information. The increased availability of arterial probe data since that time has allowed for an analysis of several major commuter arterials across the state of Indiana.

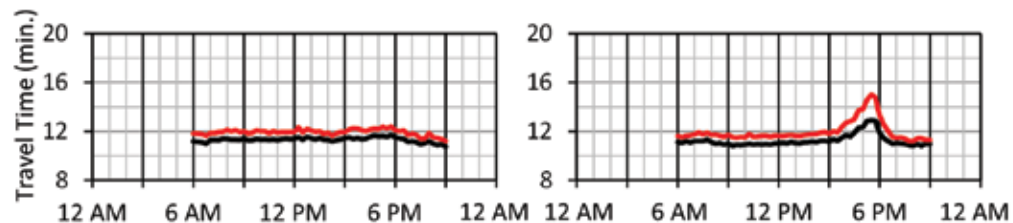
Figure 16 shows a sample data view for southbound SR 37 south of Indianapolis. Median (black line) and 85th percentile (red line) travel times are shown by time of day for the four quarters of both 2011 and 2012. Throughout most of the year the lines retain a consistent shape, reflecting that the traffic patterns throughout the day tend to be stable. In the southbound direction there is an increase in travel times occurring around 5:00 PM beginning in the fourth quarter of 2011 and continuing throughout 2012. As a result of this analysis, this corridor was identified for signal system maintenance and retiming. Those activities were performed in March 2013 and mitigated much of the evening travel time delay. A similar analysis is carried out for 10 arterial routes in Appendix F.



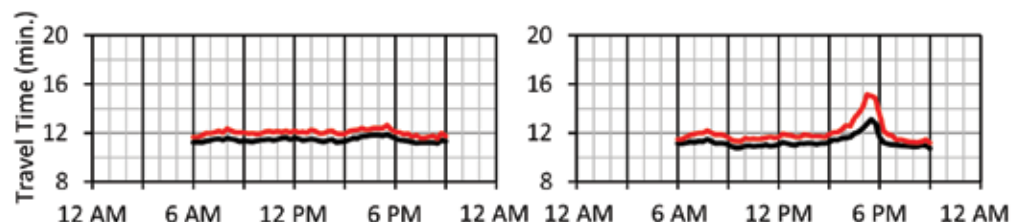
(a) Corridor details.



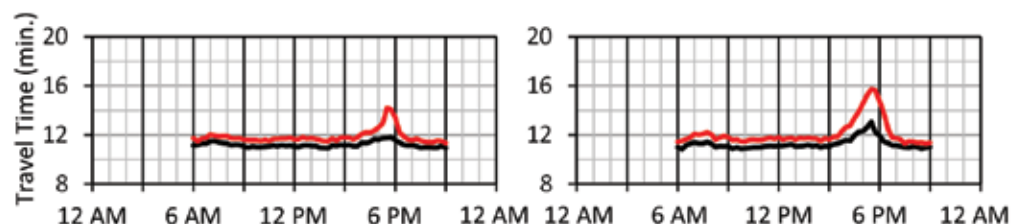
(b) Quarter 1 (Jan.-Mar.) travel times (50th and 85th percentiles).



(c) Quarter 2 (Apr.-Jun.) travel times (50th and 85th percentiles).

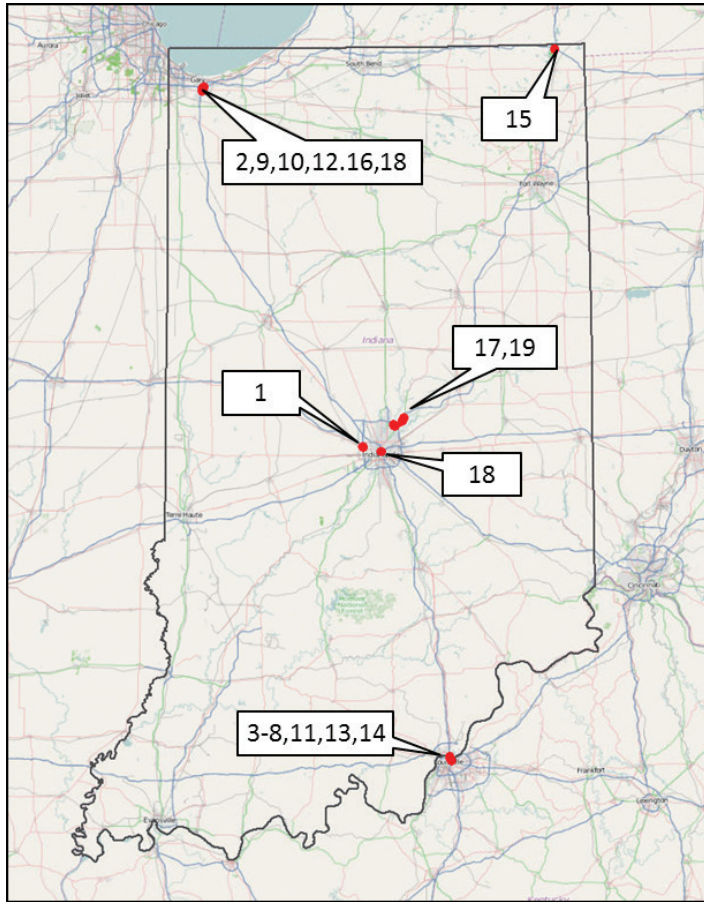


(d) Quarter 3 (Jul.-Sep.) travel times (50th and 85th percentiles).



(e) Quarter 4 (Oct.-Dec.) travel times (50th and 85th percentiles).

Figure 16. Southbound SR 37 south of Indianapolis:  
 Quarterly travel time summary.



**Figure 17.**  
Top 20 congestion hour (CH)  
segments throughout the Indi-  
ana interstate system.

RANK	INTERSTATE	LENGTH (miles)	SEGMENTS (mile markers)	2012 CH (hours)	2012 TTD (hours)
1	I-74 E	0.52	72.0 to 72.5	<b>4028.3</b>	19.7
2	I-65 S	0.77	260.4 to 259.7	<b>2191.5</b>	41.4
3	I-65 S	0.12	0.5 to 0.4	<b>1902.3</b>	15.6
4	I-65 S	0.42	0.4 to 0.0	<b>1902.0</b>	31.6
5	I-65 S	0.02	0.8 to 0.7	<b>1707.0</b>	2.3
6	I-65 S	0.15	0.6 to 0.5	<b>1704.0</b>	18.9
7	I-65 S	0.07	0.7 to 0.6	<b>1694.0</b>	9.6
8	I-65 S	0.15	0.9 to 0.8	<b>1646.3</b>	27.8
9	I-65 S	1.10	259.7 to 258.6	<b>1436.3</b>	26.9
10	I-65 N	0.81	259.4 to 260.2	<b>1355.5</b>	27.0
11	I-65 S	0.37	1.3 to 0.9	<b>1326.5</b>	82.5
12	I-65 N	1.07	258.4 to 259.4	<b>1194.0</b>	25.3
13	I-65 S	0.44	1.7 to 1.3	<b>780.3</b>	77.2
14	I-65 S	0.01	1.7 to 1.7	<b>597.8</b>	1.1
15	I-69 N	0.54	356.0 to 356.6	<b>579.8</b>	3.0
16	I-65 S	0.28	258.6 to 258.3	<b>573.3</b>	3.1
17	I-69 N	1.59	202.9 to 204.5	<b>555.0</b>	63.3
18	I-65 S	0.22	113.8 to 113.6	<b>538.5</b>	13.8
19	I-69 S	0.60	202.9 to 202.3	<b>538.3</b>	22.2
20	I-465 IL	0.84	34.1 to 34.9	<b>524.3</b>	23.7

## CONGESTION RANK- INGS

In this section the most congested corridors in the Indiana interstate highway system are identified. The congestion rankings offer two different perspectives on congestion, based on two different performance measures (congestion hours and travel time deficit). The change in travel time deficit between 2011 and 2012 is also presented, offering an opportunity to compare operations between the two years.

### Absolute Ranking of Observed Congestion

Figure 17 identifies the 20 interstate segments with the highest number of conges-

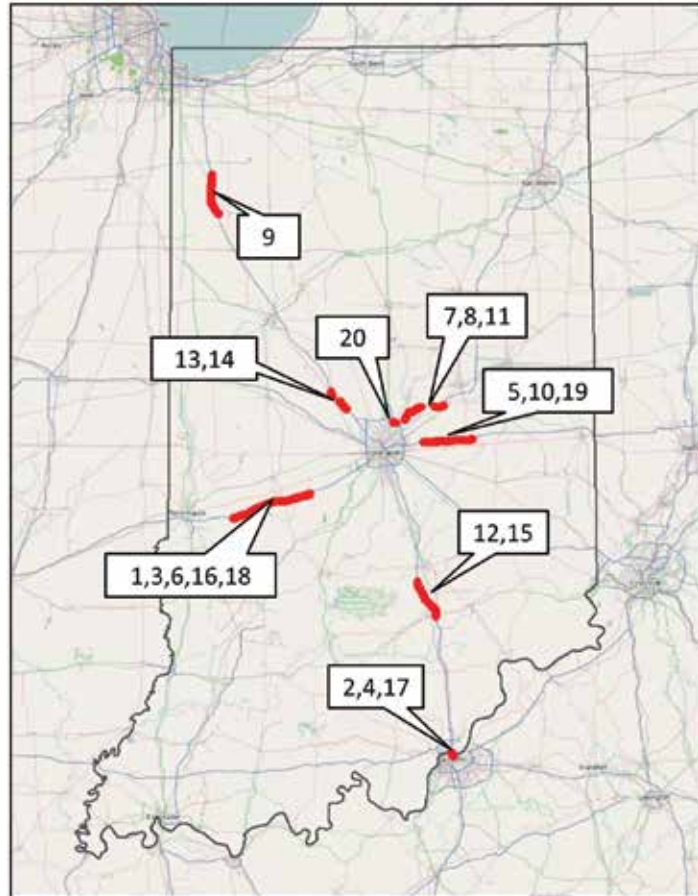
tion hours in 2012; Figure 18 identifies the 20 interstate highway segments with the highest travel time deficit in 2012. As illustrated, the congestion hours metric tends to focus on short segments in the most congested areas (Figure 17), while the travel time deficit metric identifies segments where travel times are most strongly affected (Figure 18).

- In 2012, the highest number of congestion hours occurred on a 0.5-mile section of eastbound I-74 close to Indianapolis (Figure 17).



Despite the high number of congestion hours accrued at this location, the effect on travel times was rather modest.

- In 2012, the highest travel time deficit, 174 hours, was observed on a section of eastbound I-70 west of Indianapolis (Figure 18). However, only 257 congestion hours were observed on the segment, a relatively small number. This suggests that the congestion was rather severe and affected long distances within the hours that it took place.



RANK	INTERSTATE	LENGTH (miles)	SEGMENTS (mile markers)	2012 TTD (hours)	2012 CH (hours)
1	I-70 E	13.93	22.5 to 36.4	<b>174.1</b>	257.3
2	I-65 S	0.37	1.3 to 0.9	<b>82.5</b>	1326.5
3	I-70 W	13.93	36.5 to 22.6	<b>82.0</b>	173.0
4	I-65 S	0.44	1.7 to 1.3	<b>77.2</b>	780.3
5	I-70 W	7.11	103.0 to 95.9	<b>75.5</b>	81.8
6	I-70 W	9.01	49.5 to 40.6	<b>75.2</b>	167.5
7	I-69 N	3.70	214.7 to 218.3	<b>72.7</b>	168.0
8	I-69 N	1.59	202.9 to 204.5	<b>63.3</b>	555.0
9	I-65 N	14.25	215.1 to 229.3	<b>61.3</b>	32.8
10	I-70 E	7.09	95.5 to 102.5	<b>60.6</b>	94.0
11	I-69 S	5.02	210.4 to 205.6	<b>60.1</b>	157.8
12	I-65 N	5.35	49.9 to 55.3	<b>59.4</b>	69.0
13	I-65 S	1.48	142.1 to 140.6	<b>55.3</b>	296.0
14	I-65 N	3.67	133.5 to 137.2	<b>53.5</b>	176.5
15	I-65 S	6.97	63.9 to 56.9	<b>52.8</b>	73.0
16	I-70 E	3.46	36.9 to 40.3	<b>50.8</b>	143.0
17	I-65 S	0.42	2.2 to 1.7	<b>50.4</b>	474.0
18	I-70 E	8.96	40.8 to 49.7	<b>47.6</b>	164.5
19	I-70 W	8.85	112.5 to 103.6	<b>45.3</b>	24.5
20	I-465 IL	1.03	33.0 to 34.1	<b>44.8</b>	442.5

Figure 18.  
Top 20 travel time deficit (TTD) segments throughout the Indiana interstate system.

The two performance measures offer two different perspectives on congestion in the interstate highway system. The congestion hour performance measure locates potential bottlenecks with concentrated congestion, while the travel time deficit performance measure identifies segments introducing substantial delay. A complete set of figures showing congestion hours and travel time deficit for the interstate system are shown in Appendix E.



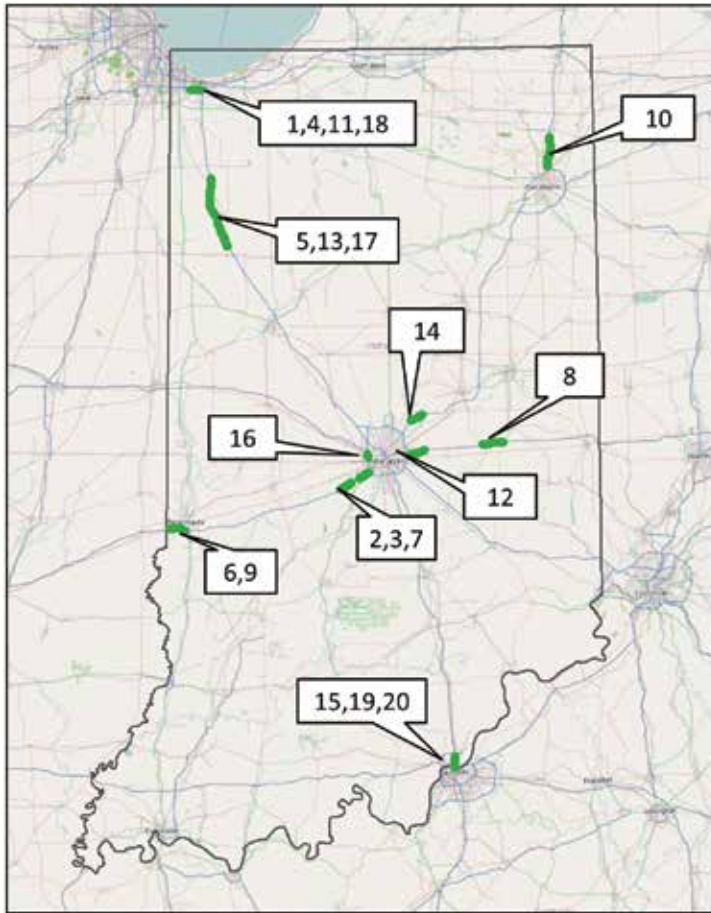


Figure 19.

Most improved interstate segments based on travel time deficit (TTD).

RANK	INTERSTATE	LENGTH (miles)	SEGMENTS (mile markers)	2011 TTD (hours)	2012 TTD (hours)	Difference (2011-2012)
1	I-94 E	1.80	6.9 to 8.7	153.6	11.8	141.8
2	I-70 W	4.04	72.4 to 68.4	118.8	1.9	116.9
3	I-70 W	4.55	65.5 to 60.5	143.4	39.0	104.4
4	I-94 E	0.74	8.7 to 9.5	108.1	8.4	99.7
5	I-65 N	9.14	205.3 to 214.4	66.3	2.5	63.8
6	I-70 E	2.93	3.8 to 6.7	67.3	10.3	57.0
7	I-70 E	4.45	60.5 to 65.5	79.2	25.5	53.6
8	I-70 E	7.09	115.4 to 122.5	50.6	2.1	48.5
9	I-70 E	2.32	0.9 to 3.2	56.7	8.4	48.3
10	I-69 N	9.96	316.0 to 326.0	57.3	10.9	46.4
11	I-94 E	0.73	9.8 to 10.5	54.6	9.4	45.2
12	I-70 W	4.60	95.5 to 91.0	58.6	14.4	44.2
13	I-65 S	9.20	214.7 to 205.5	49.5	6.7	42.9
14	I-69 N	4.58	205.4 to 210.0	53.0	11.9	41.1
15	I-65 S	1.78	5.3 to 3.6	77.5	37.2	40.4
16	I-465 IL	1.30	13.9 to 15.2	59.7	22.3	37.4
17	I-65 S	14.28	229.6 to 215.3	64.3	27.8	36.4
18	I-94 E	0.28	9.5 to 9.8	40.6	4.5	36.0
19	I-65 S	0.42	2.2 to 1.7	85.9	50.4	35.5
20	I-65 S	0.44	1.7 to 1.3	111.6	77.2	34.3

## Most Significant Changes from 2011 to 2012

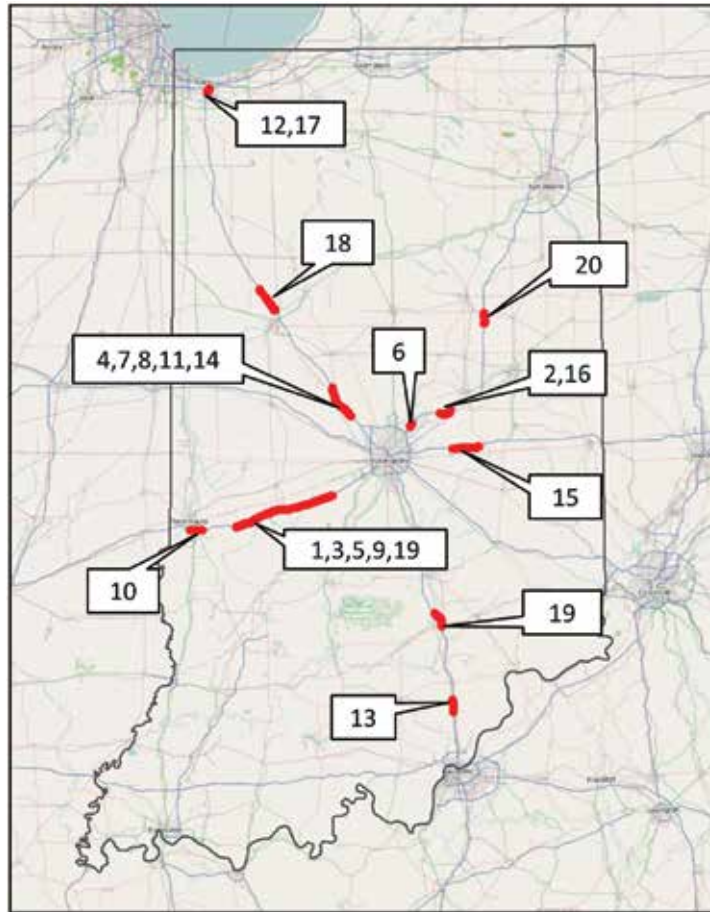
In addition to absolute ranking of congestion, with two years of data it is feasible to identify the most improved and most degraded segments from year to year.

Figure 19 shows a map of the locations of the 20 segments with the greatest improvement in travel time deficit between 2011 and 2012. The most improved seg-

ment was a 1.8-mile section of eastbound I-94 (from MM 6.9 to MM 8.7), which saw the travel time deficit improve by almost 142 hours due to completion of construction projects on I-94. Similar improvements are seen on several other segments along I-70, I-65, and a few other locations. The 2011 closure of I-64 (the Sherman Minton Bridge) in the Louisville area contributed

to high congestion on I-65 between MM 0 and MM 6. The performance of those segments improved substantially after the reopening of I-64 in February 2012.

The 20 segments with the most degraded travel times are mapped in Figure 20. These increases in travel time are largely associated with road construction projects beginning in 2012. Particularly significant increases are found on I-70 west of Indianapolis and I-65 in the Lebanon area. By comparing Figure 20 to Figure 19, it is possible to observe the impact of I-70 construction as the construction activity moves from one section to another. Similar trends can be seen on I-69 and I-65.



RANK	INTERSTATE	LENGTH (miles)	SEGMENTS (mile markers)	2011 TTD (hours)	2012 TTD (hours)	Difference (2011-2012)
1	I-70 E	13.93	22.5 to 36.4	66.0	174.1	-108.1
2	I-69 N	3.70	214.7 to 218.3	6.1	72.7	-66.6
3	I-70 W	13.93	36.5 to 22.6	18.2	82.0	-63.8
4	I-65 N	5.35	49.9 to 55.3	7.5	59.4	-51.9
5	I-70 W	9.01	49.5 to 40.6	28.3	75.2	-46.9
6	I-69 N	1.59	202.9 to 204.5	17.1	63.3	-46.3
7	I-65 S	1.48	142.1 to 140.6	16.8	55.3	-38.5
8	I-65 N	3.67	133.5 to 137.2	15.6	53.5	-37.9
9	I-70 E	3.46	36.9 to 40.3	16.9	50.8	-33.9
10	I-70 E	4.21	7.1 to 11.3	3.9	35.4	-31.5
11	I-65 S	3.53	145.8 to 142.3	12.3	39.3	-27.0
12	I-65 S	0.77	260.4 to 259.7	14.5	41.4	-26.9
13	I-65 S	4.23	24.1 to 19.9	5.7	32.5	-26.9
14	I-65 N	0.84	137.8 to 138.7	5.0	29.2	-24.2
15	I-70 W	8.85	112.5 to 103.6	21.1	45.3	-24.1
16	I-69 N	0.61	218.3 to 219.0	0.9	23.8	-22.9
17	I-65 S	1.10	259.7 to 258.6	5.1	26.9	-21.9
18	I-65 S	9.02	187.9 to 178.9	0.8	22.7	-21.8
19	I-70 W	6.15	56.0 to 49.8	19.9	41.2	-21.3
20	I-69 S	3.53	258.8 to 255.3	4.3	24.5	-20.2

Figure 20.  
Most degraded interstate segments based on travel time deficit (TTD).





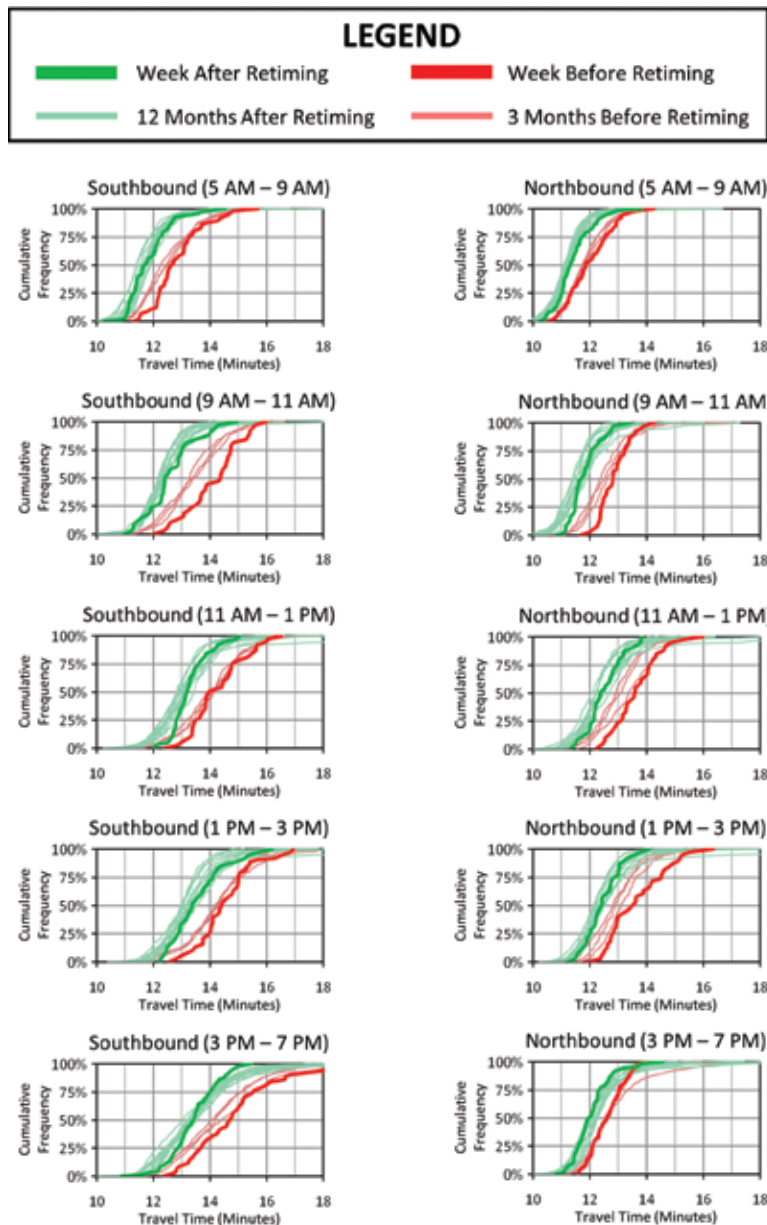


Figure 22.  
Kokomo signal  
retiming monthly  
summary.

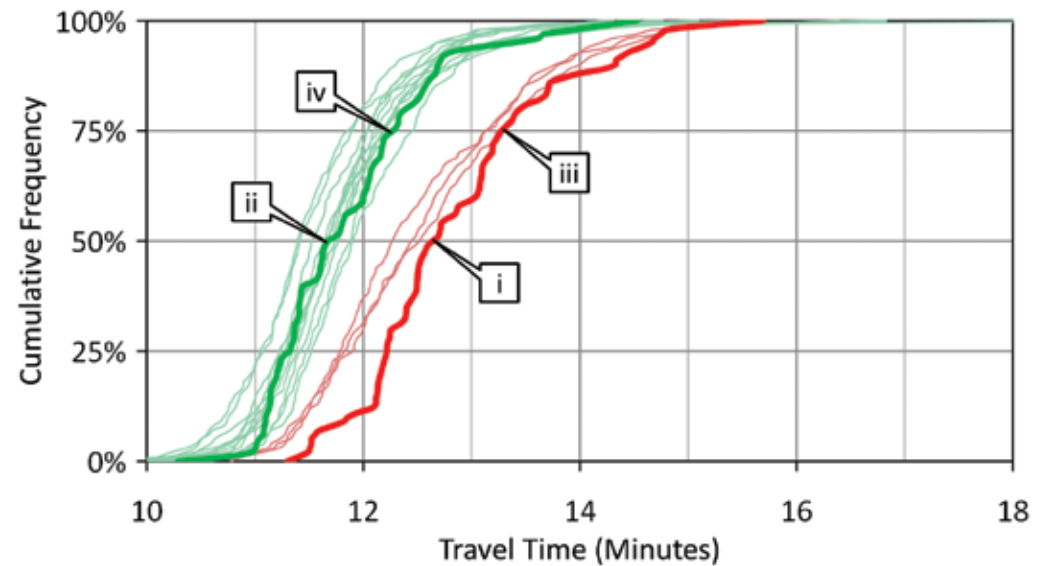


Figure 23. Southbound US 31  
from 5 AM to 9 AM travel times  
before and after retiming.

To illustrate how to read these figures, four callouts are shown on the southbound 5 AM–9 AM plot corresponding to the median travel time before retiming (Figure 23i), the median travel time after retiming (Figure 23ii), the 75th percentile travel time before retiming (Figure 23iii), and 75th percentile travel time after retiming (Figure 23iv). Median values correspond to the typical user, where 50% of the users had shorter travel times and 50% had longer travel times. The 75th percentile travel times are a reasonable indicator of reliability, where 75% of the users had faster travel times and 25% had slower travel times.

In Figure 22, all 10 plots show that, in general, the median and 75th percentile travel times were improved by approximately 1 minute, with only modest stochastic variation throughout the year.

A cost savings analysis was performed using the week prior to the signal retiming as a baseline travel time, along with the median monthly travel times and traffic count data. The annual user costs benefits for the period of April 2012 to April 2013 associated with retiming these signals was estimated to be approximately \$2.7 million on the basis of the Texas Transportation Institute values for commuter and commercial vehicle users.

### Capital Project Completion and Congestion Cost Reductions

Congestion cost related to travel time delay is calculated on a roadway segment when the average speed falls 10 mph or more below the posted speed limit. For this report, congestion costs were tabulated for three interstate highway sections to compare performance between 2011 and 2012: I-465 in the greater Indianapolis area, I-94 in northwest Indiana, and I-65 in the Louisville area. These sections were selected because of significant road construction and detours taking place within the 2011–2012 time period.

#### *I-465 Improvements*

I-465 is a beltway around Indianapolis. Traffic volumes vary along the loop, with the west side typically carrying approximately 100,000 vehicles per day. The Accelerate 465 project was initiated in 2007 to improve mobility on I-465. In December 2011, major sections of



Accelerate 465 on the west side were completed. Figure 24 shows a map plus before and after air photos of two of the I-465 interchanges that were reconstructed.

Figure 25 and Figure 26 show speed profiles for the I-465 outer loop (counterclockwise circulation) for 2011 and 2012 respectively, while Figure 27 and Figure 28 show speed profiles for the inner loop (clockwise circulation) for 2011 and 2012 respectively. Throughout nearly all of 2011, the speeds on the west side of I-465 (Figure 25a and Figure 27a) were predominantly in the range of 45–55 mph with a modest amount of congestion (speeds below 45 mph) around MM 16. Qualitatively comparing Figure 25 with Figure 26 and Figure 27 with Figure 28 makes it is clear that there were significant improvements in travel speeds as these reconstruction projects were completed. Some congestion at MM 16 can still be seen in the 2012 data (Figure 26b, Figure 28b) and is associated with the final stages of the I-465 construction.

**Figure 24.**  
Interchange geometry improvements on I-465.



a. Map of I-465 showing three interchanges where ramps were improved.



b. I-465 at I-74, 8/26/2010.



d. I-465 at Sam Jones Expressway, 8/26/2010.



c. I-465 at I-74, 8/29/2012.



e. I-465 at Sam Jones Expressway, 8/29/2012.



Figure 25.  
Speed profile, I-465  
outer loop, 2011.



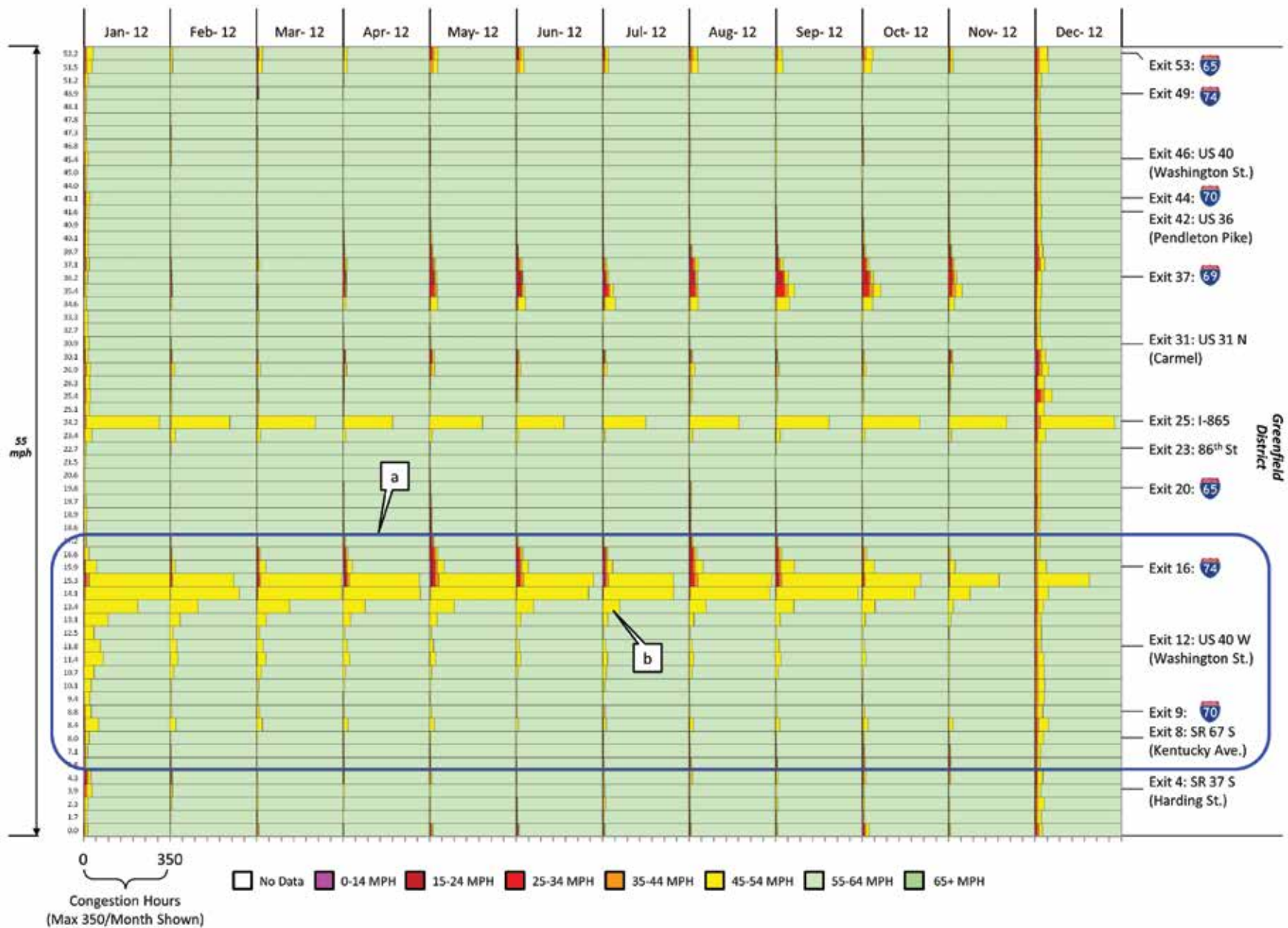


Figure 26.  
Speed profile, I-465  
outer loop, 2012.



Figure 27.  
Speed profile, I-465  
inner loop, 2011.

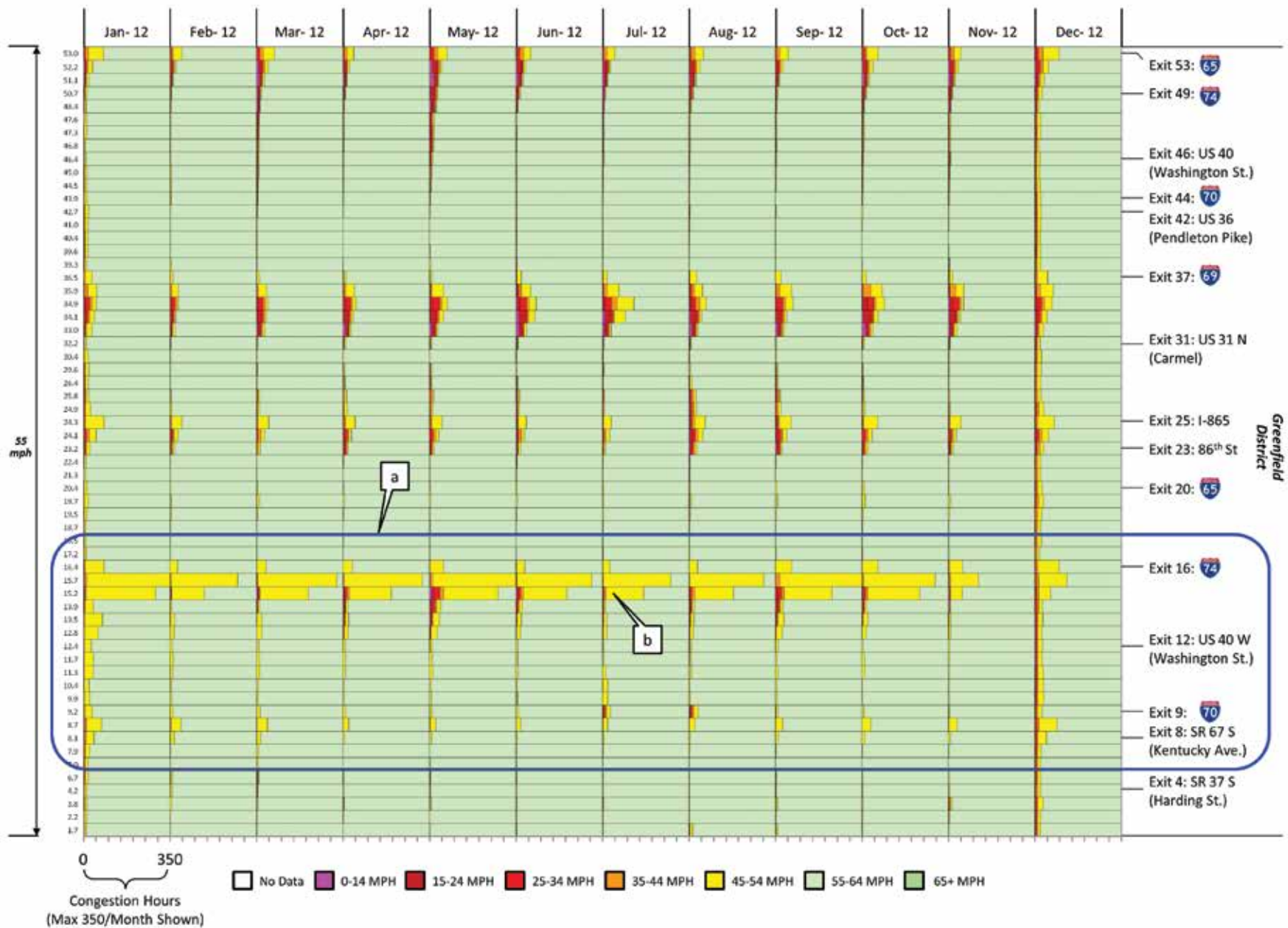


Figure 28.  
Speed profile, I-465  
inner loop, 2012.





Figure 29. Areas of interest on I-94 (Borman Expressway).

### *I-94 Improvements*

The Borman Expressway is the portion of I-94 that runs from the Indiana–Illinois border through the interchange with I-65 (Figure 29). With 160,000 vehicles per day, this section of roadway is one of the busiest interstate corridors in Indiana. Starting in 2004, a series of projects completely rebuilt the corridor, adding travel lanes. The last major construction projects, which contributed to significant eastbound congestion (Figure 30) during this time period, were substantially completed in 2011.

Figure 31 and Figure 32 respectively show the scaled speed profiles for eastbound I-94 from 2011 and 2012. As shown in these profiles, the roadway sections from Exit 11 (Figure 31a, Figure 32a) to the Illinois state line (Figure 31b, Figure 32b) are

the areas of significant change in congestion between 2011 and 2012. Substantial speed reductions related to construction occurred in 2011 (Figure 31c), with the most severe reductions in July (Figure 31d). After completion of the project in September 2011, the congestion is substantially reduced (Figure 32c). In late spring 2012, reconstruction of a bridge at Martin Luther King Drive around MM 11 led to temporary lane closures (lasting approximately 30 minutes at a time and occurring from 11 PM to 5 AM). The effects of those rolling 30-minute closures can be seen in May and June 2012 (Figure 32d). Other than these occurrences, there was a substantial decrease in recurring congestion on I-94 following the completion of the construction projects in September 2011.



Figure 30. Congestion on eastbound I-94.

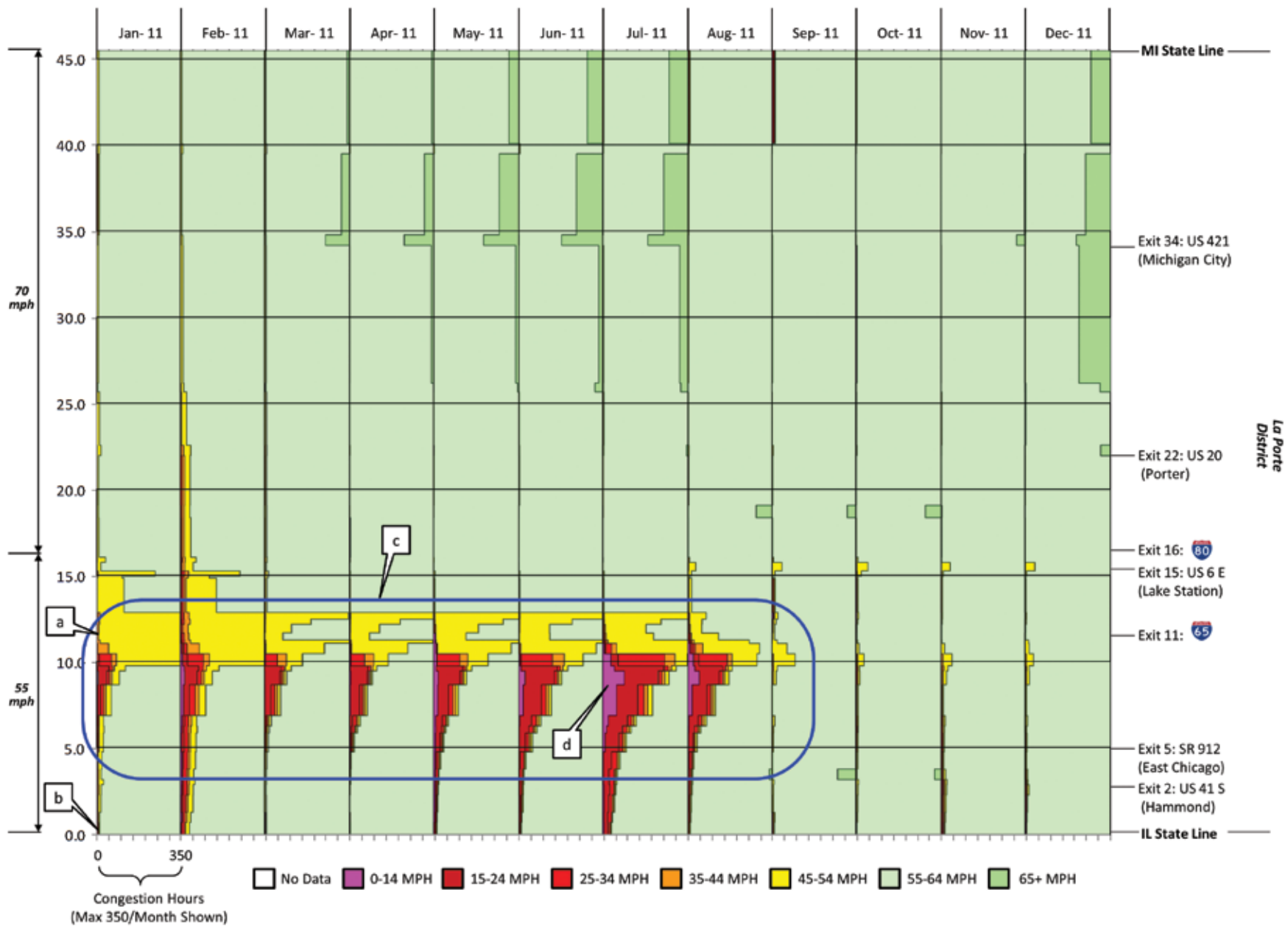


Figure 31.  
Eastbound I-94 speed  
profile with linear  
distance scale, 2011.

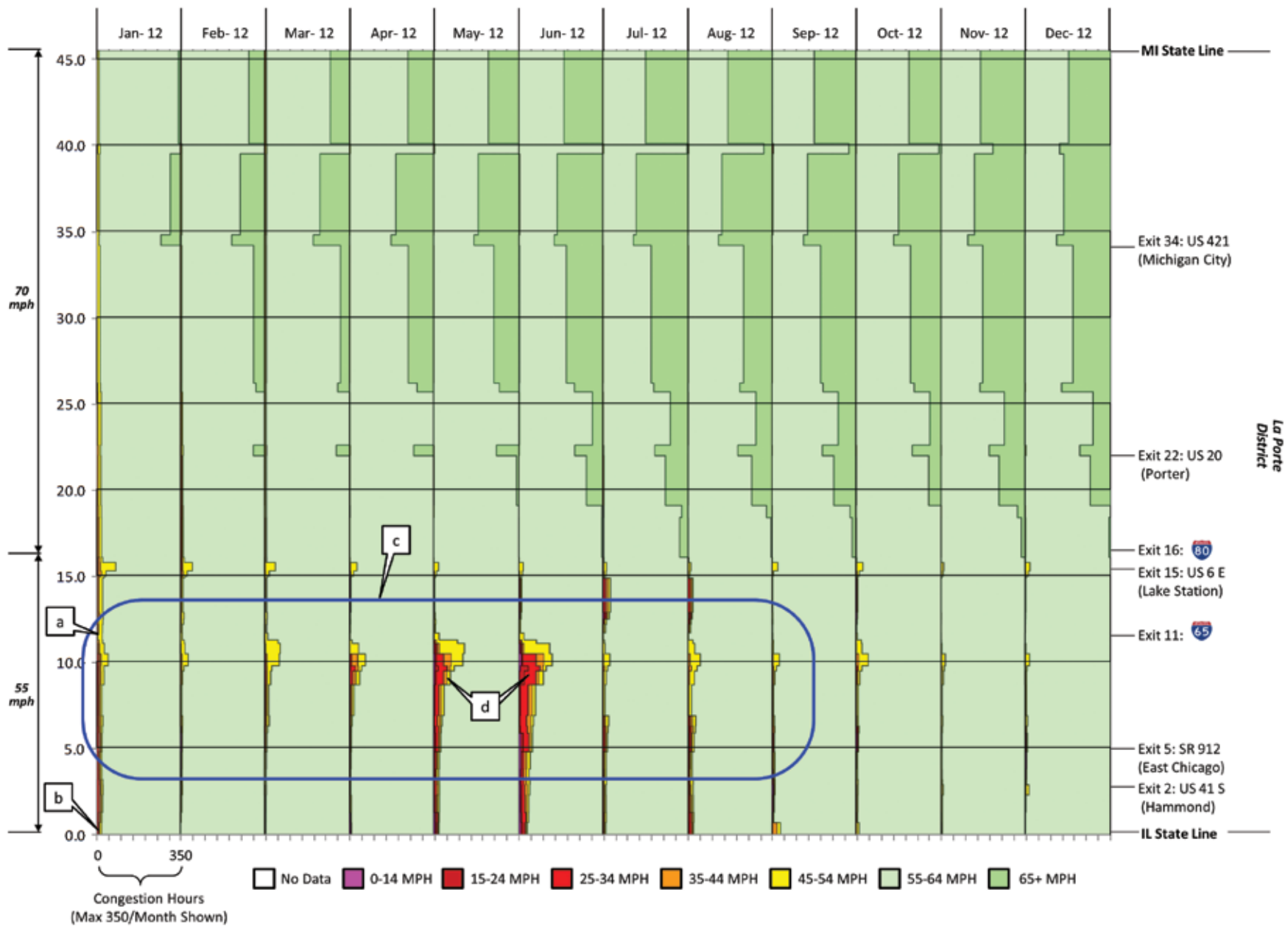


Figure 32.  
Eastbound I-94 speed  
profile with linear  
distance scale, 2012.



### *I-65 Congestion Reduction*

Figure 33 shows a map of I-65 in the greater Louisville area. Two interstate bridges cross the Ohio River: the Kennedy Bridge (I-65) and the Sherman Minton Bridge (I-64). The Sherman Minton Bridge was closed between September 2011 and February 2012. This closure diverted I-64 traffic to I-65, causing heavy congestion in the southbound direction on I-65 throughout the six months that the bridge was closed.

The impact of this closure on I-65 congestion is shown in Figure 34 and Figure 35, which are speed profiles for southbound I-65 (focusing on the lower 16 miles of the corridor) for 2011 and 2012 respectively. Occurrences of severe congestion are clearly visible in late 2011 (Figure 34a) and early 2012 (Figure 35a). During the other parts of the year, normal operations show that there is some congestion on the sections close to MM 1.0 that can be severe at times. Not only did the added traffic from I-64 cause the severity of congestion to increase, but the effects cascaded back to I-265 at MM 6.0, which was the route that most of the diverted traffic would have used. Conditions after the reopening of the Sherman Minton Bridge are very similar to those prior to the closure.



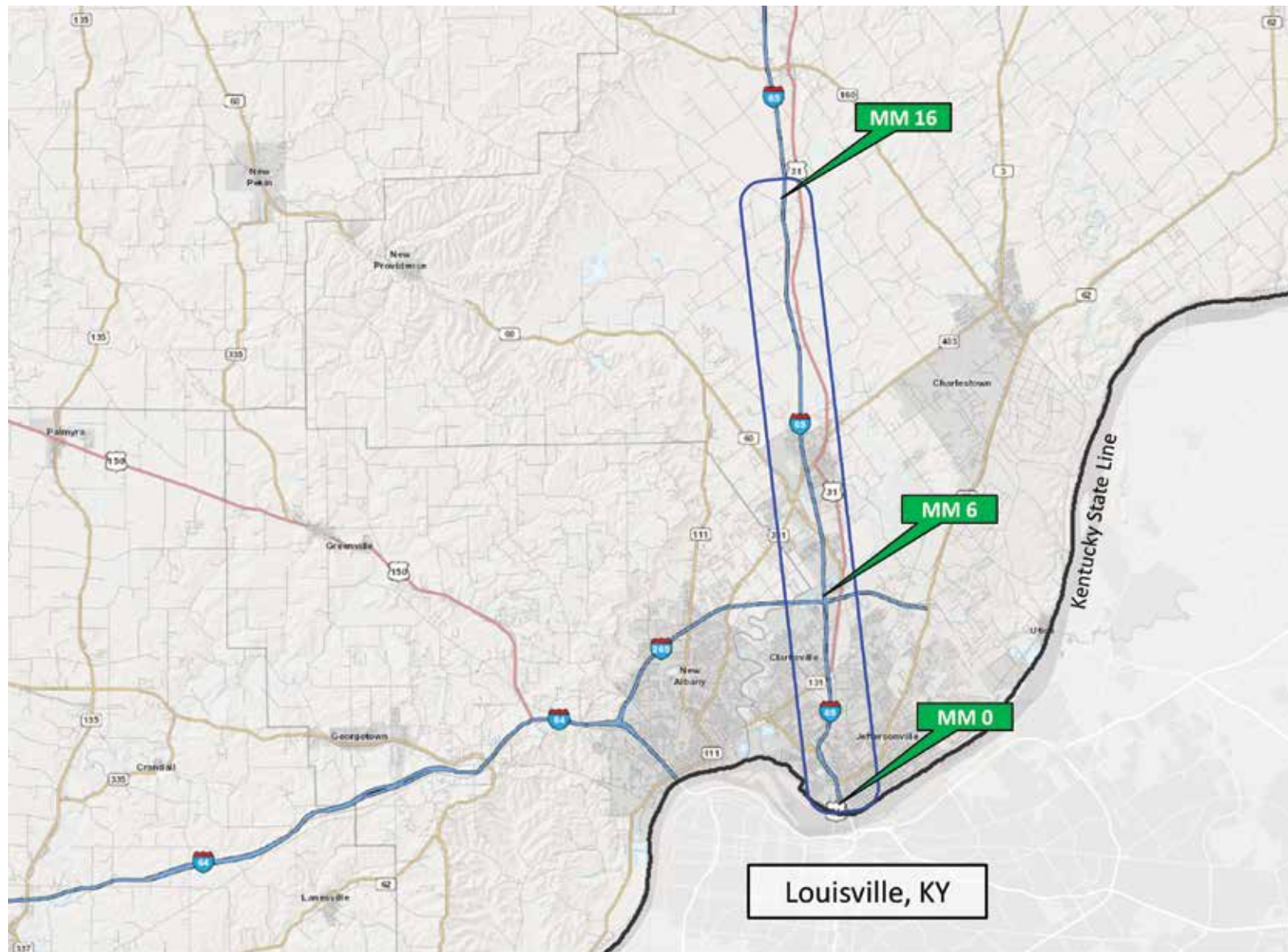


Figure 33. I-65 in the Louisville area.

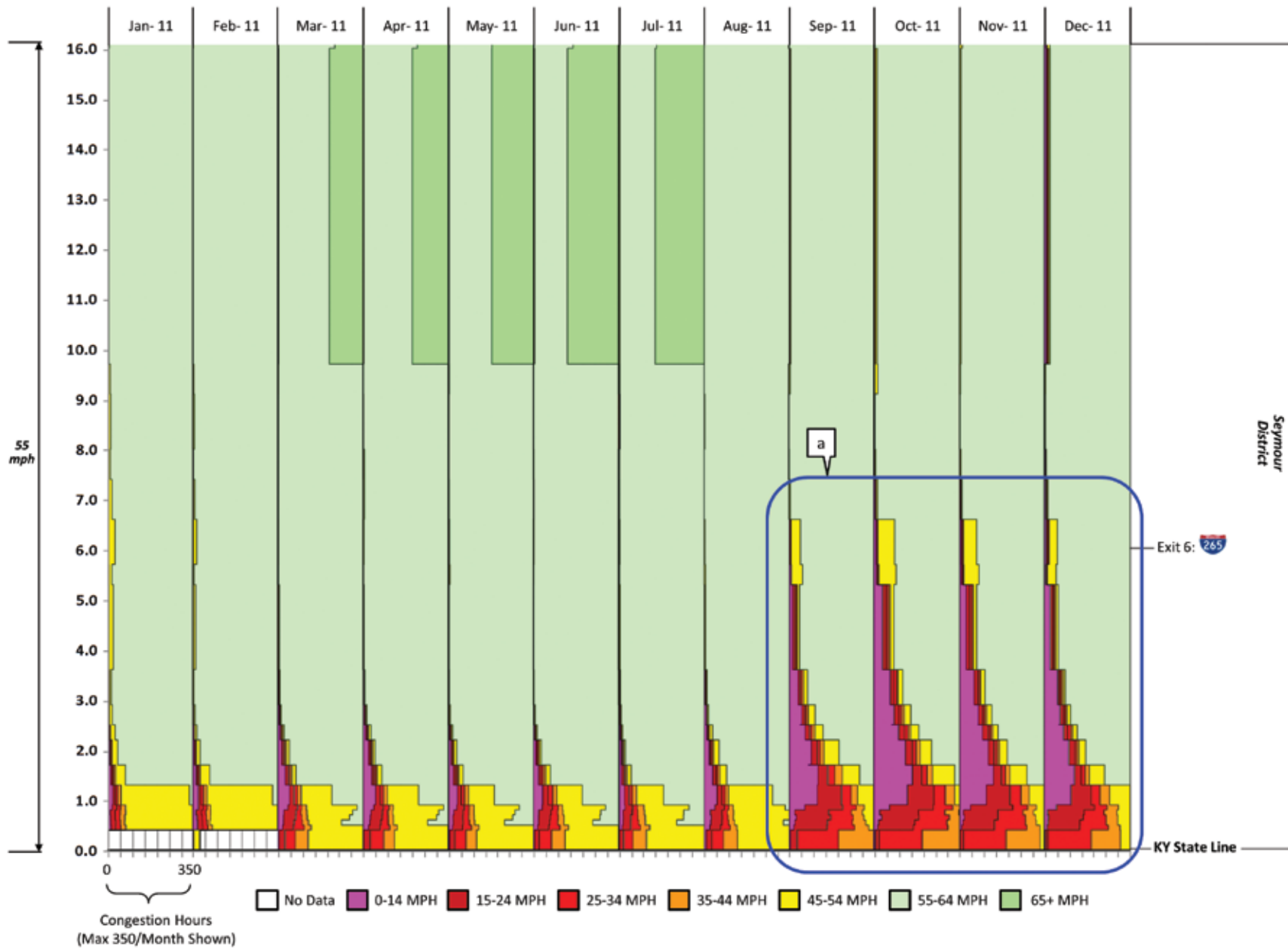


Figure 34.  
Southbound I-65 (MM  
0 to MM 16) scaled  
speed profile, 2011.

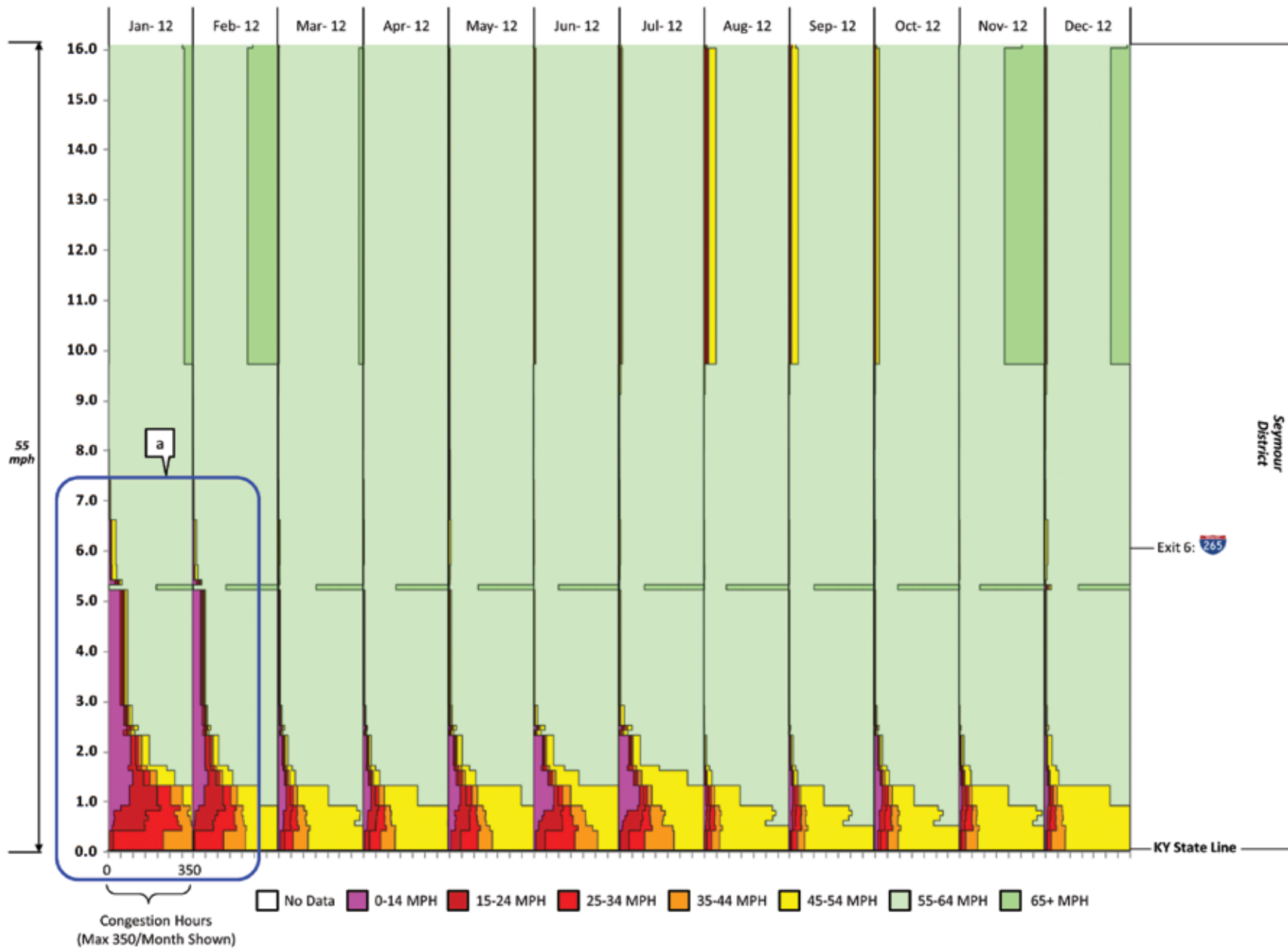


Figure 35.  
Southbound I-65 (MM  
0 to MM 16) scaled  
speed profile, 2012.

### *Summarizing Congestion Cost Reductions*

Reductions in congestion cost on the three interstate sections of interest can be broken down as follows:

- Construction on I-94 (the Borman Expressway) in 2011 generated substantial delays in the east-bound direction. The congestion decreased significantly in 2012, after the completion of that construction.
- For I-465, road construction on the west side related to the final phases of the Accelerate 465 project (Figure 24) contributed to significant congestion in 2011.
- I-65 was affected by the closure of the I-64 crossing of the Ohio River (the Sherman Minton Bridge) between September 2011 and February 2012. During this time period, I-64 traffic was diverted to I-65, leading to substantial congestion on I-65 during that six-month span. The reopening of I-64 led to a return to normal traffic volumes on I-65 and an associated reduction of congestion.

Figure 36 provides a summary comparison between 2011 and 2012 for the above-mentioned six sections of I-465, I-94, and I-65. Distance-weighted congestion hours (Figure 36a) and travel time deficit (Figure 36b) are compared relative to their overall value for the entire Indiana interstate highway system.

Using the Texas Transportation Institute values for user costs, Figure 36c shows the estimated congestion cost per year on the selected locations of I-465, I-94, and I-65. The total user cost for 2011 was \$48 million, while for 2012 it was \$24 million, reflecting a reduction of \$24 million in user costs.



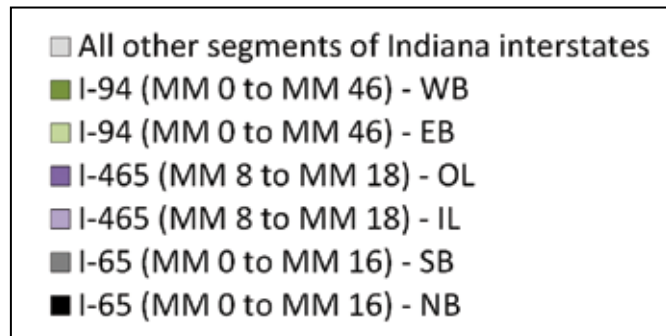
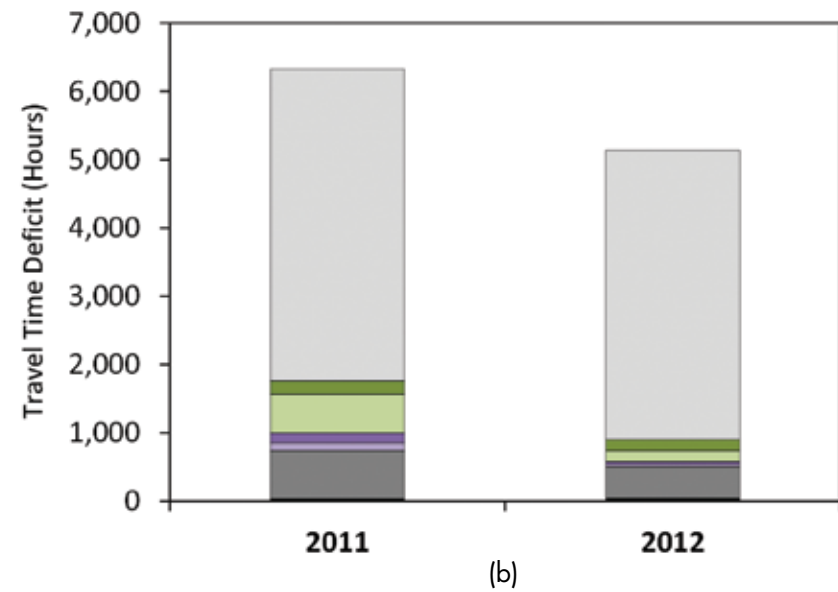
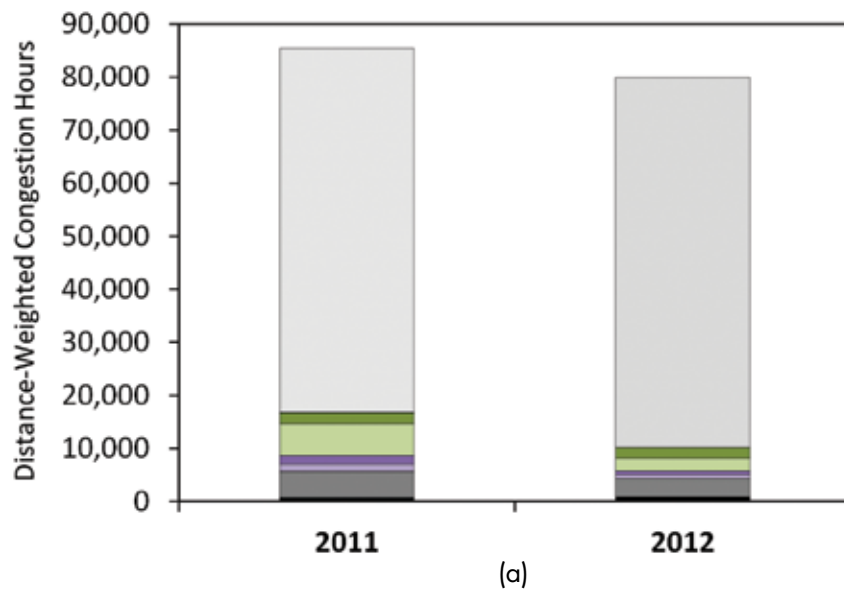
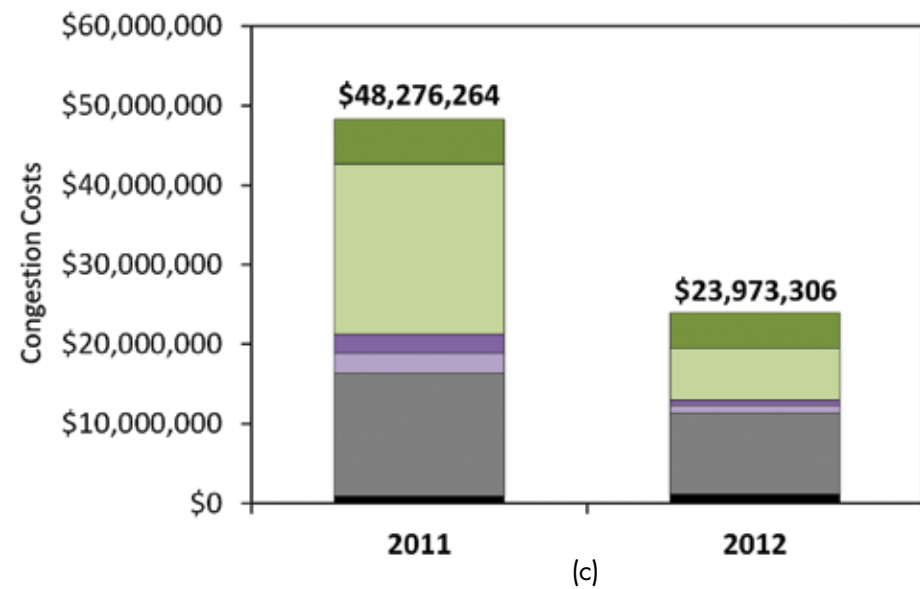


Figure 36. User savings from 2011 to 2012.

- Distance-weighted congestion hour summary.
- Travel time deficit (hours) summary.
- Estimated congestion costs for three selected locations with significant changes in 2012.



## Changes in Interstate System Performance between 2011 and 2012

The previous discussion focused on three substantial capital projects. However, it is also interesting to look at how the entire interstate system performance changes from year to year. As discussed throughout this report, a variety of factors, such as weather, active construction zones, and completed capital projects, impact congestion.

As measured by the distance-weighted congestion hour metric (Figure 36a), congestion on the entire Indiana interstate system was reduced by approximately 6% from 2011 to 2012. However, as measured by the travel time deficit metric, which includes severity of congestion (Figure 36b), congestion during this time period was reduced by approximately 18%.

## Conclusions and Future Outlook

The Indiana Department of Transportation continues to innovate how it prioritizes investments in capital and operations projects to improve Indiana mobility. This report, the second in the series, provides quantitative performance measures that identify congestion according to its frequency and severity. These new probe-data-based performance measures can also be used to provide outcome assessment to quantify the impact of infrastructure and operations-based investments.

# APPENDICES

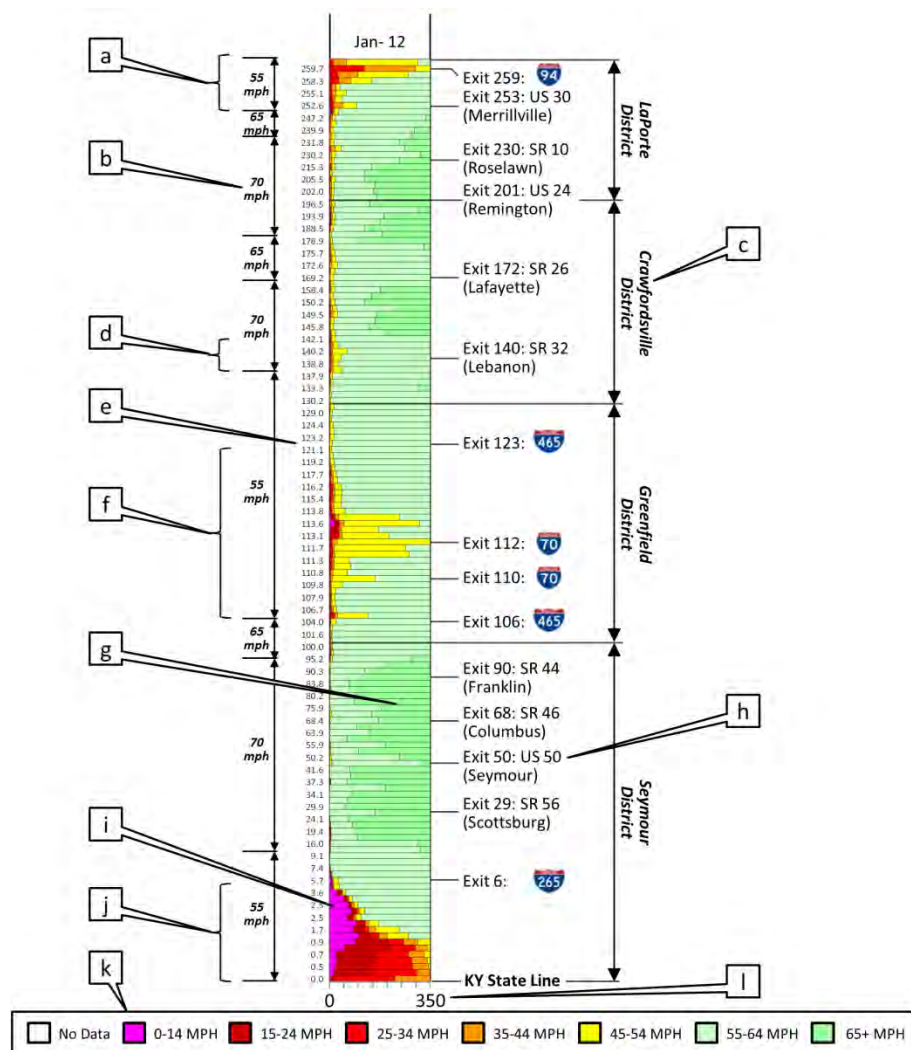
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# Appendix A: 2011 & 2012 Interstate Speed Profiles










**Summary:** For the 2012 report, the *speed profile* graphic was developed.

This plot shows how often the facility operates in different speed ranges, by month. These graphics can be used to visualize both the location and severity of congestion.

- a. Gary area
- b. Demarcation of speed limits
- c. Locations of INDOT district jurisdictions
- d. Lebanon area
- e. Mile markers of each segment
- f. Indianapolis area
- g. Example of low congestion (65+ mph)
- h. Locations of interchanges by exit/mile marker number
- i. Example of high congestion (0-14 mph)
- j. Louisville area
- k. Scale showing speed bins
- l. 1. Maximum scale set to 350 hours per month

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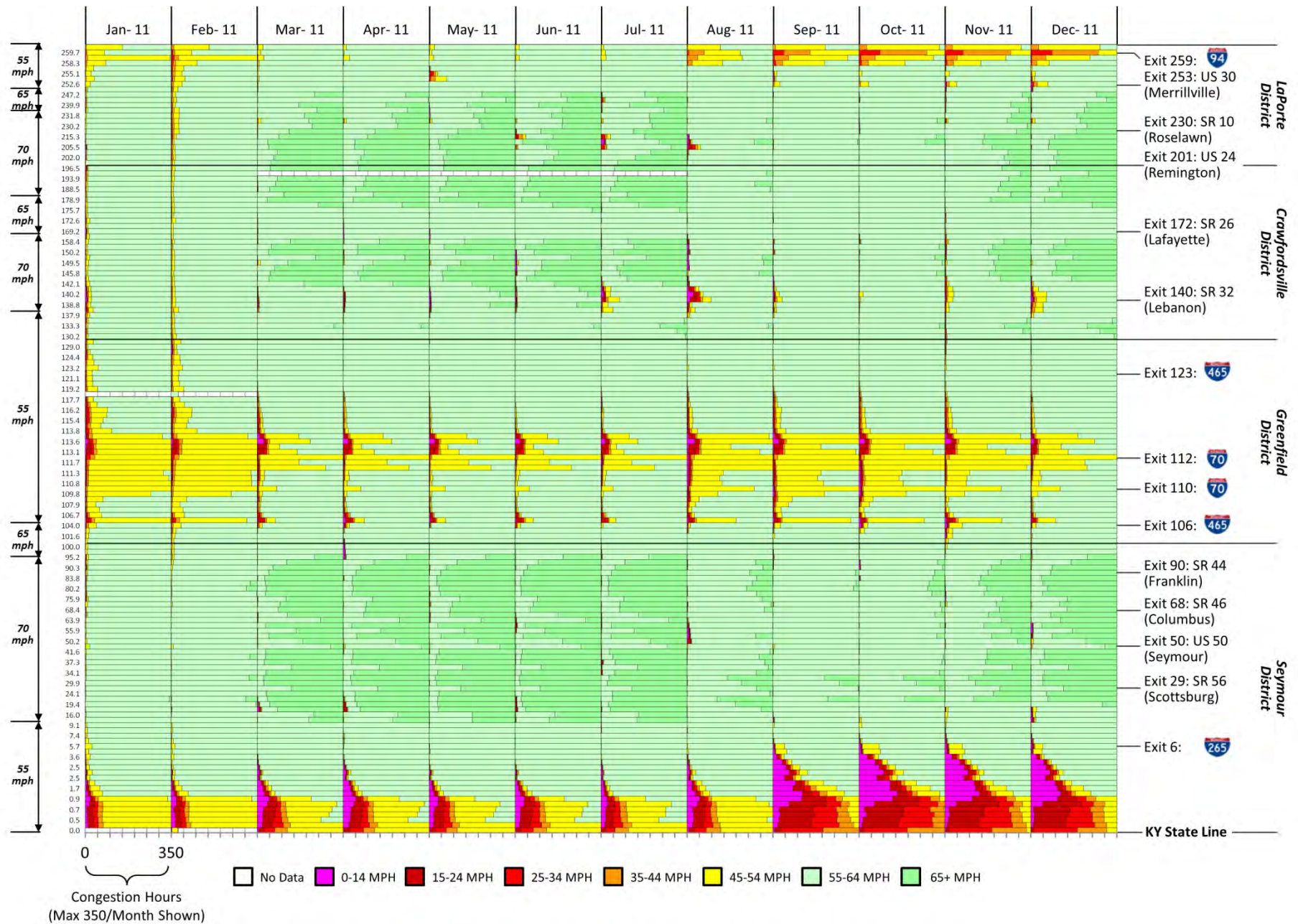


Figure A.1. Southbound I-65 speed profile, 2011.



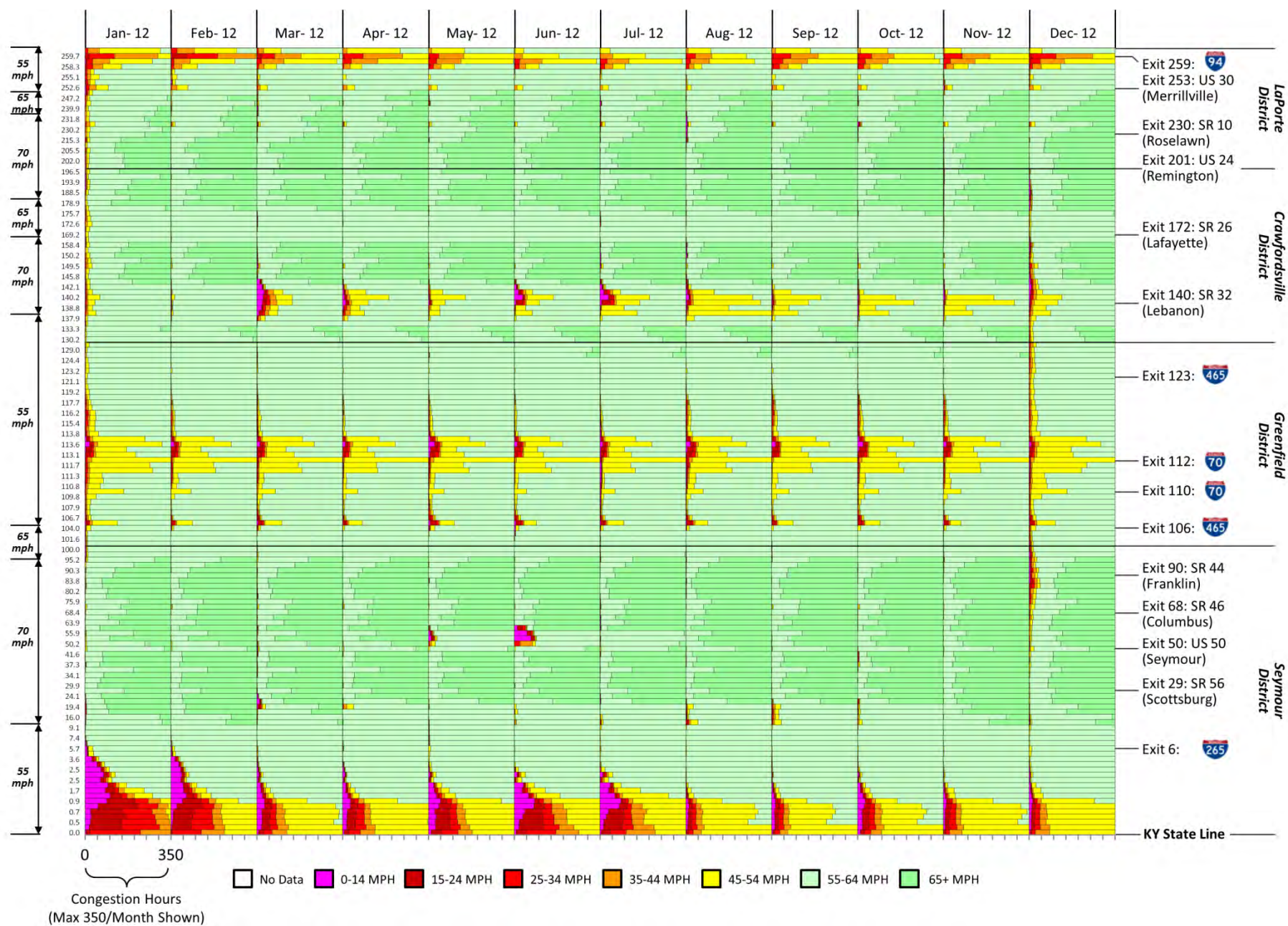


Figure A.2. Southbound I-65 speed profile, 2012.



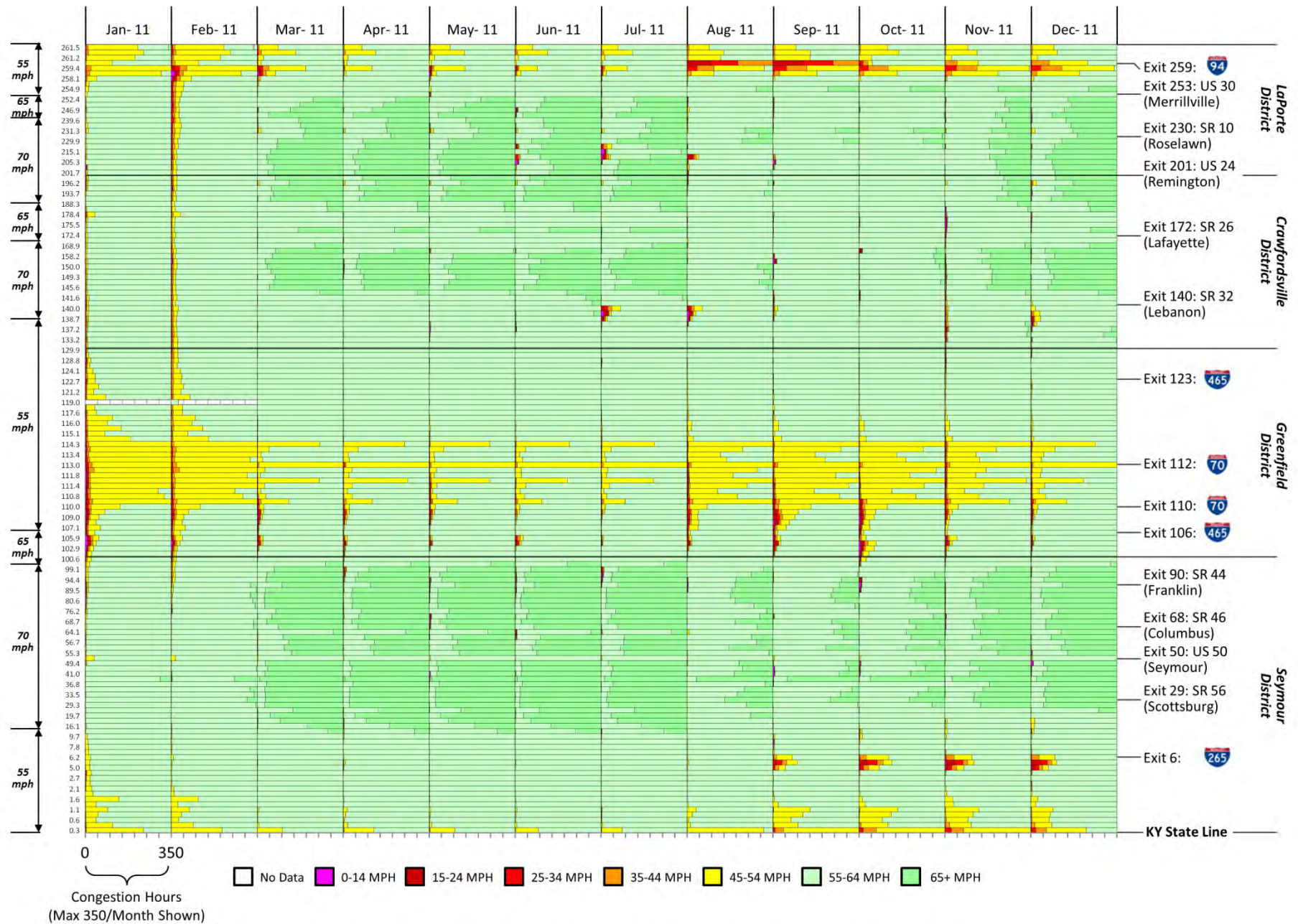


Figure A.3. Northbound I-65 speed profile, 2011.



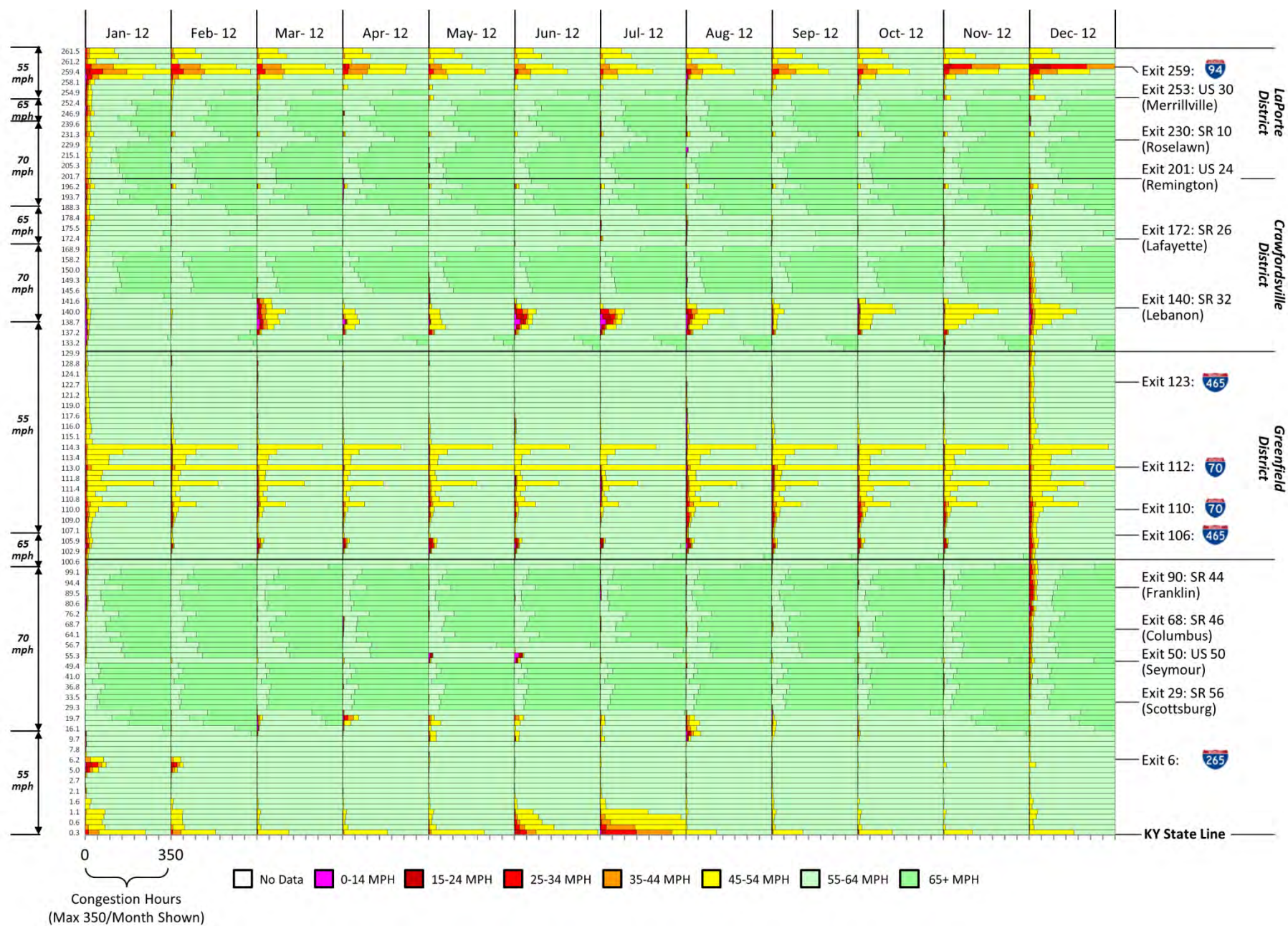


Figure A.4. Northbound I-65 speed profile, 2012.

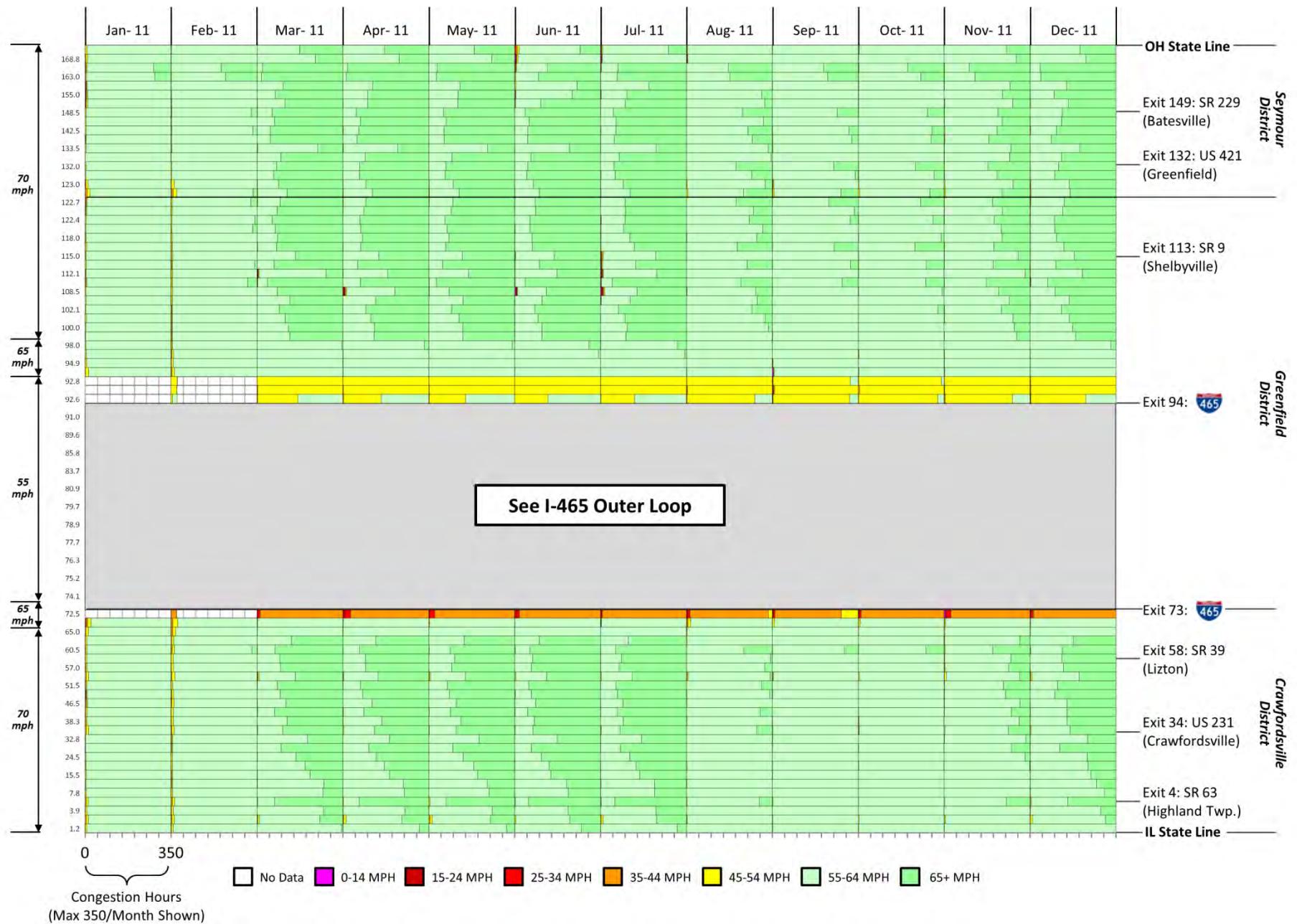


Figure A.5. Eastbound I-74 speed profile, 2011.





Figure A.6. Eastbound I-74 speed profile, 2012.

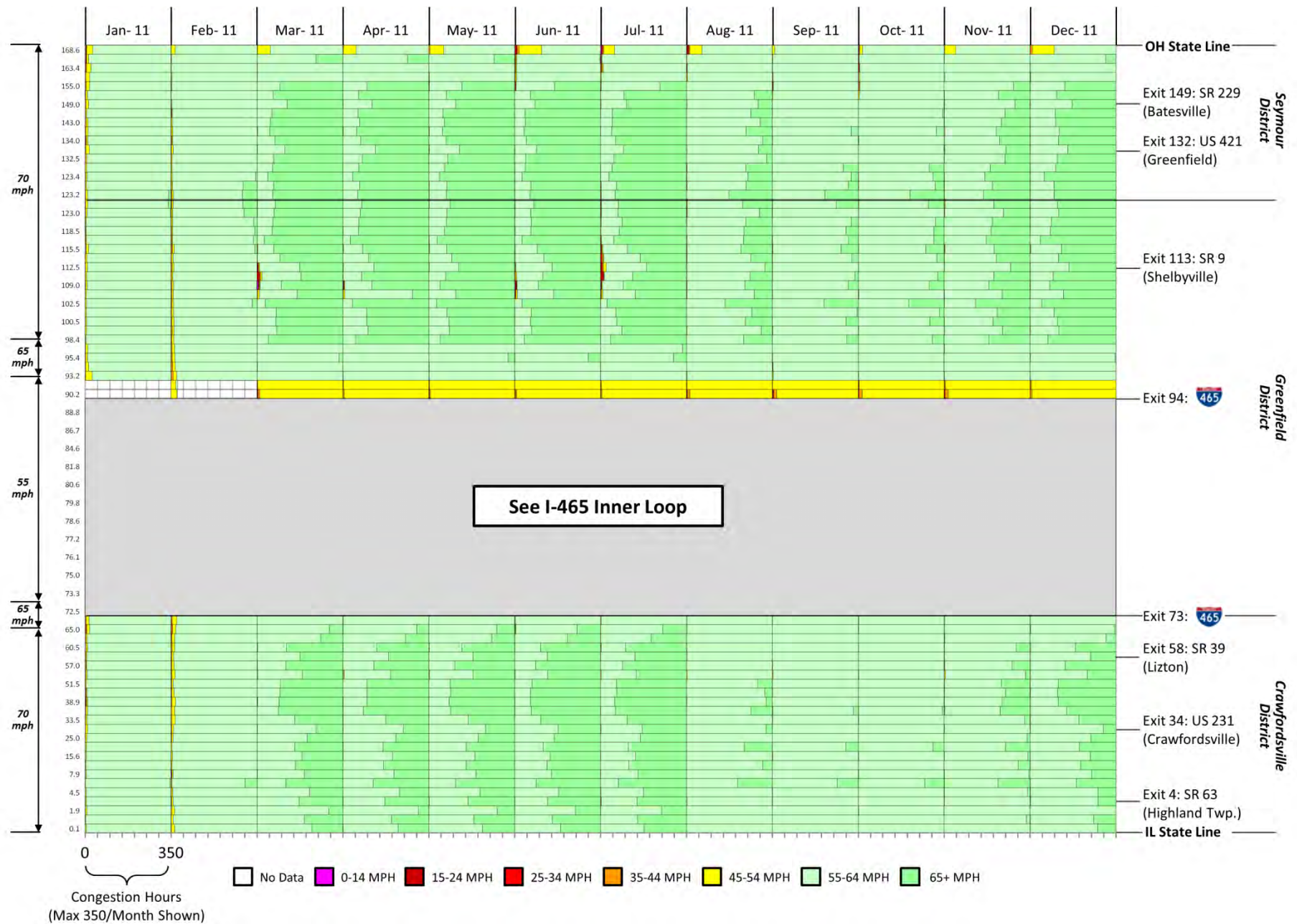


Figure A.7. Westbound I-74 speed profile, 2011.





Figure A.8. Westbound I-74 speed profile, 2012.



Figure A.9. Eastbound I-70 speed profile, 2011.



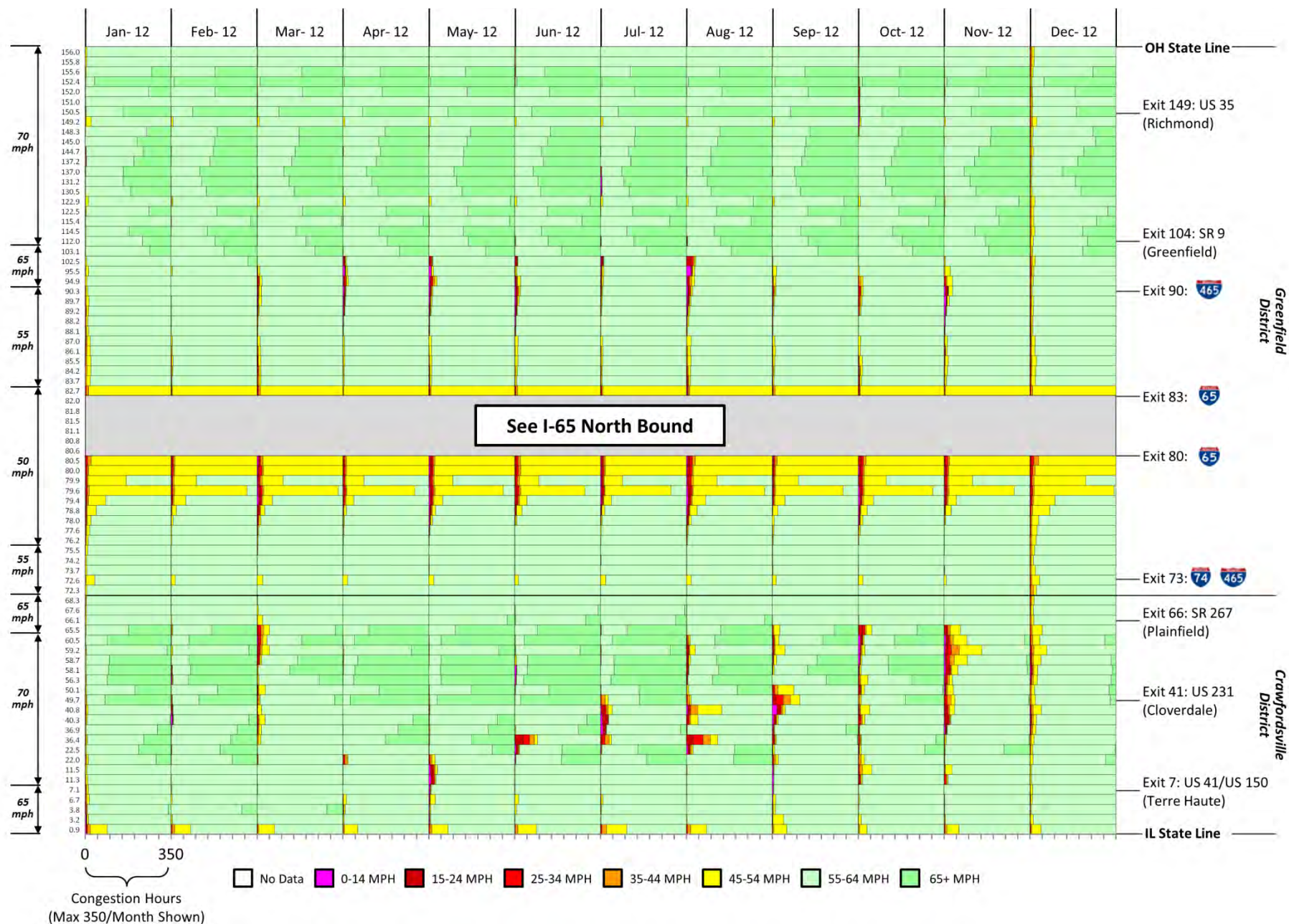


Figure A.10. Eastbound I-70 speed profile, 2012.

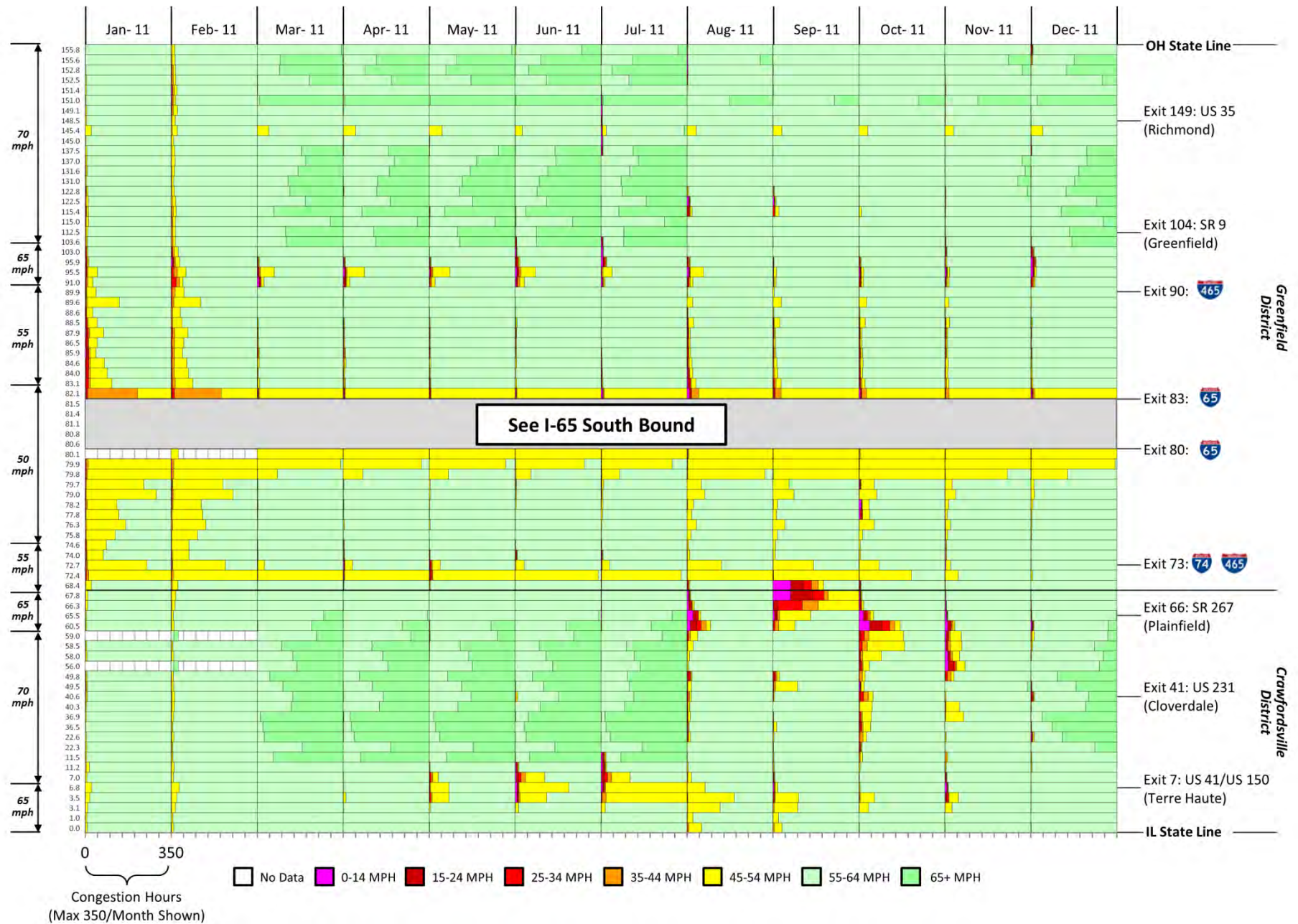


Figure A.11. Westbound I-70 speed profile, 2011.



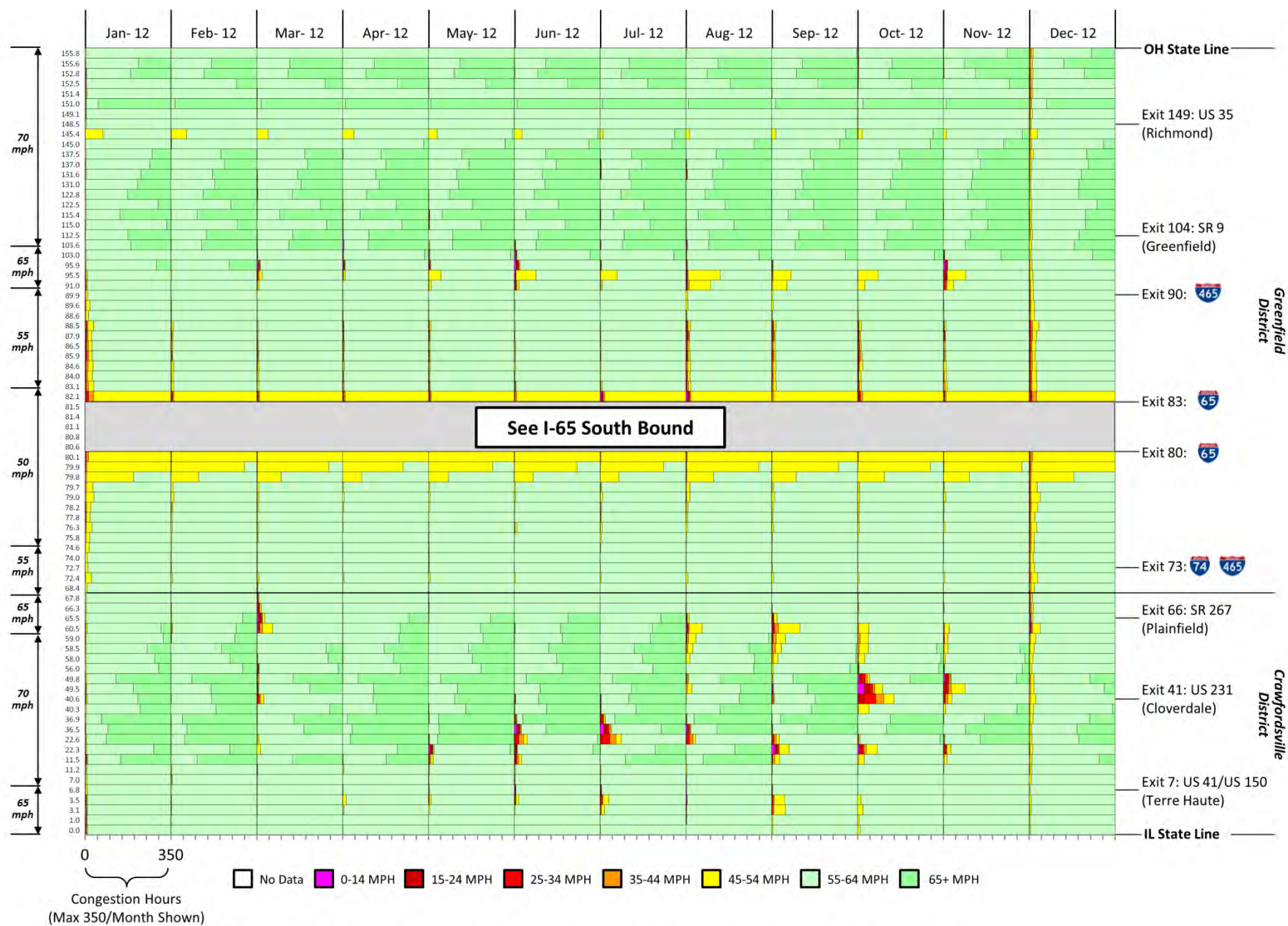


Figure A.12. Westbound I-70 speed profile, 2012.

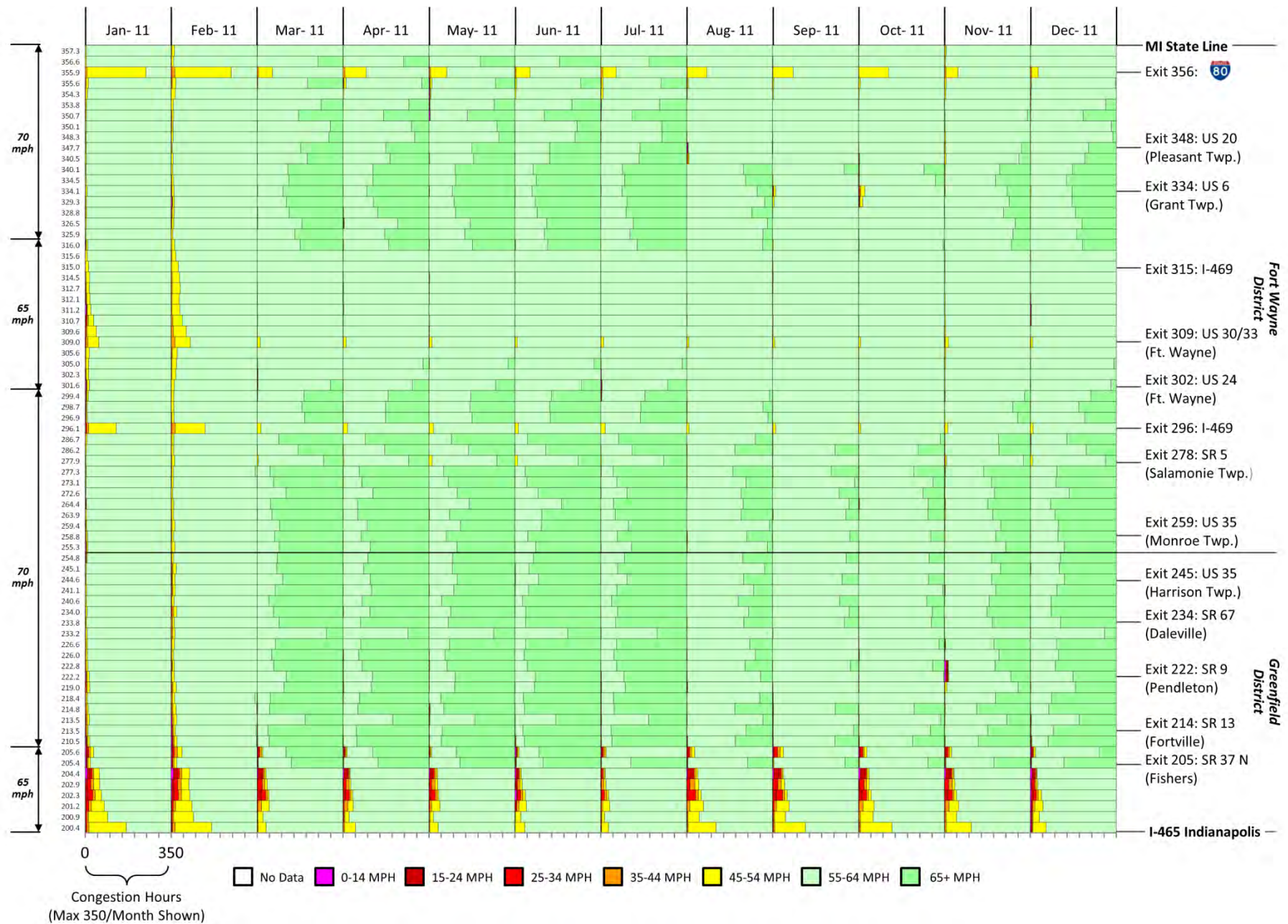


Figure A.13. Southbound I-69 speed profile, 2011.



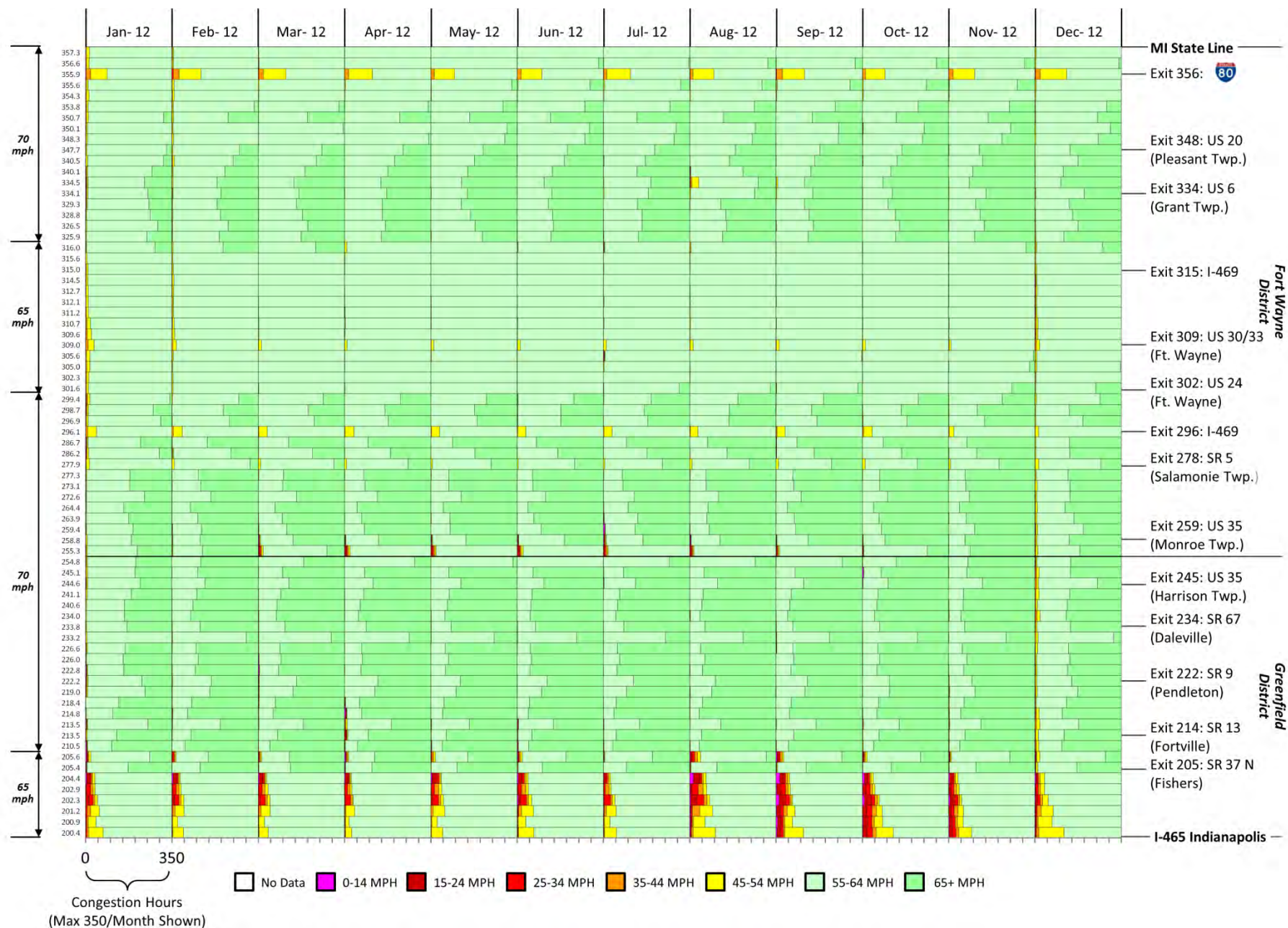


Figure A.14. Southbound I-69 speed profile, 2012.

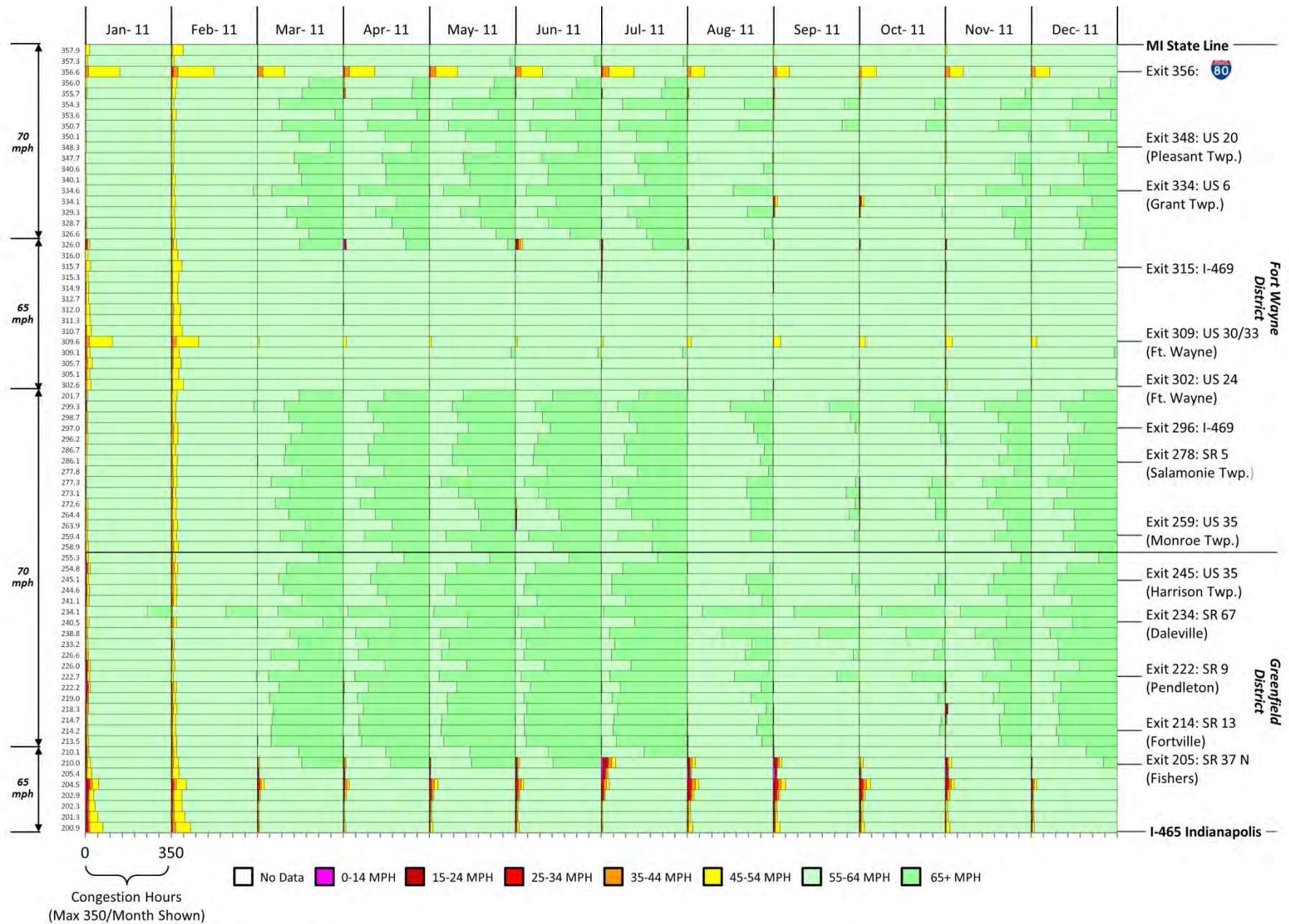


Figure A.15. Northbound I-69 speed profile, 2011.



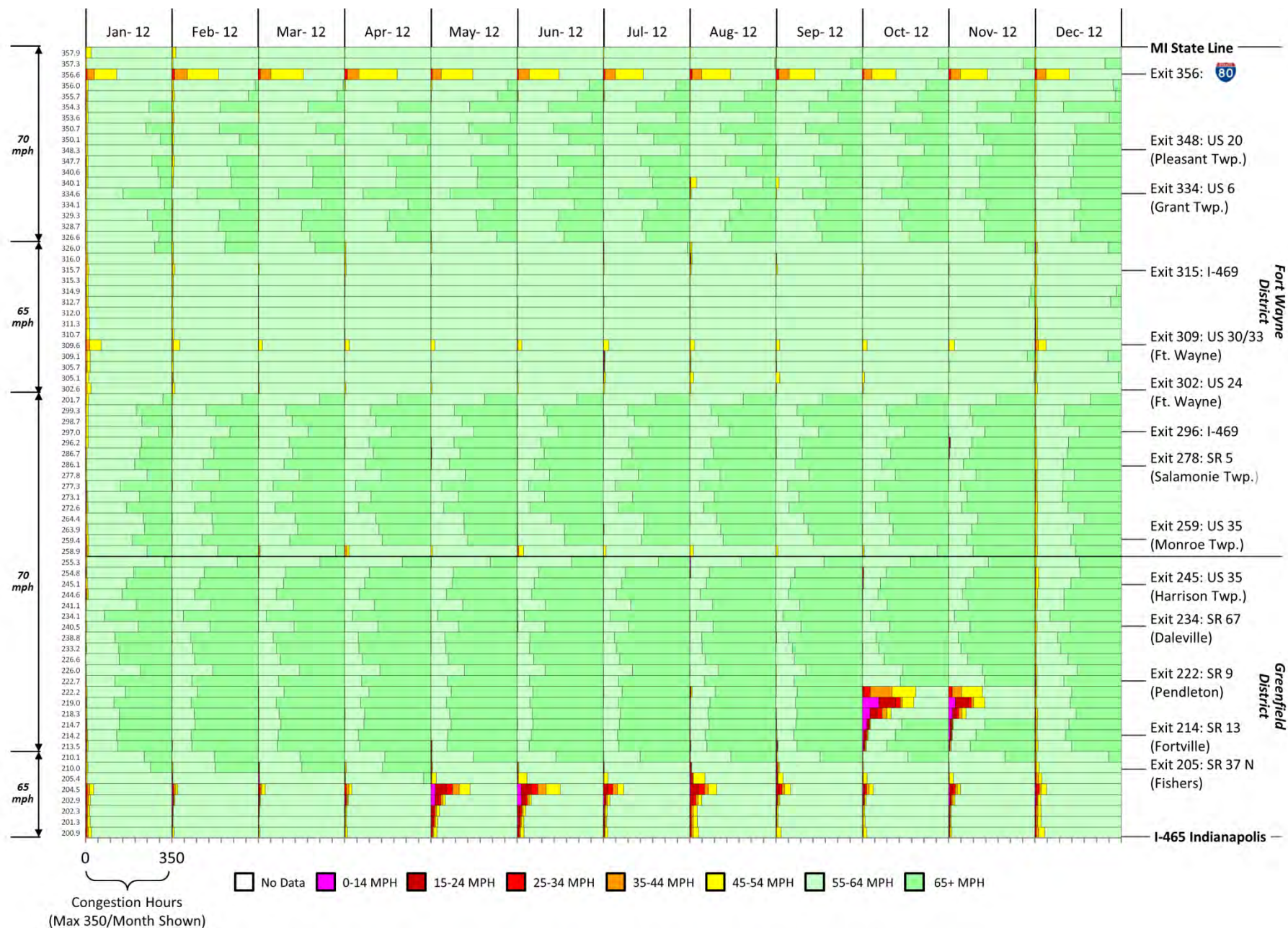


Figure A.16. Northbound I-69 speed profile, 2012.

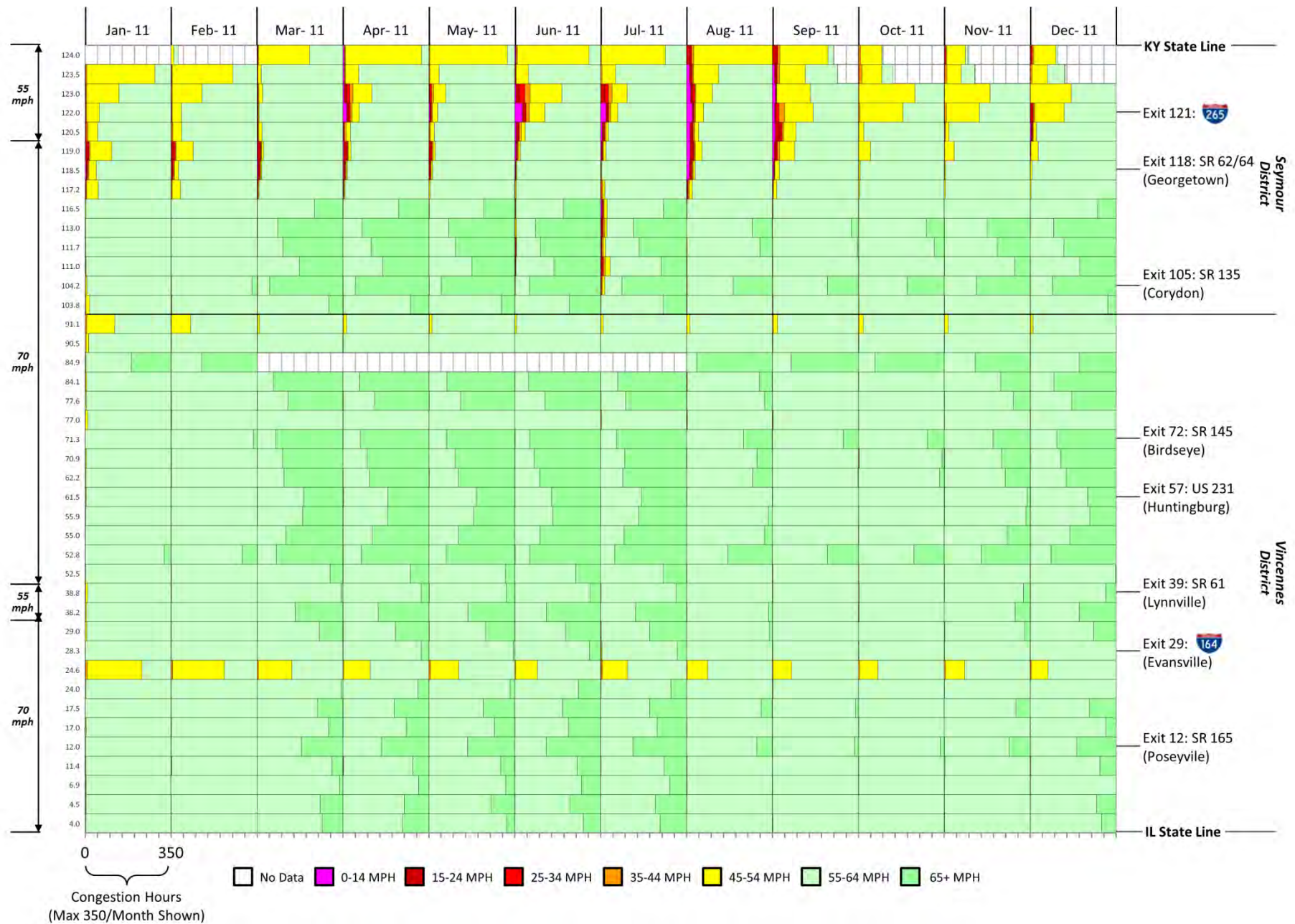


Figure A.17. Eastbound I-64 speed profile, 2011.



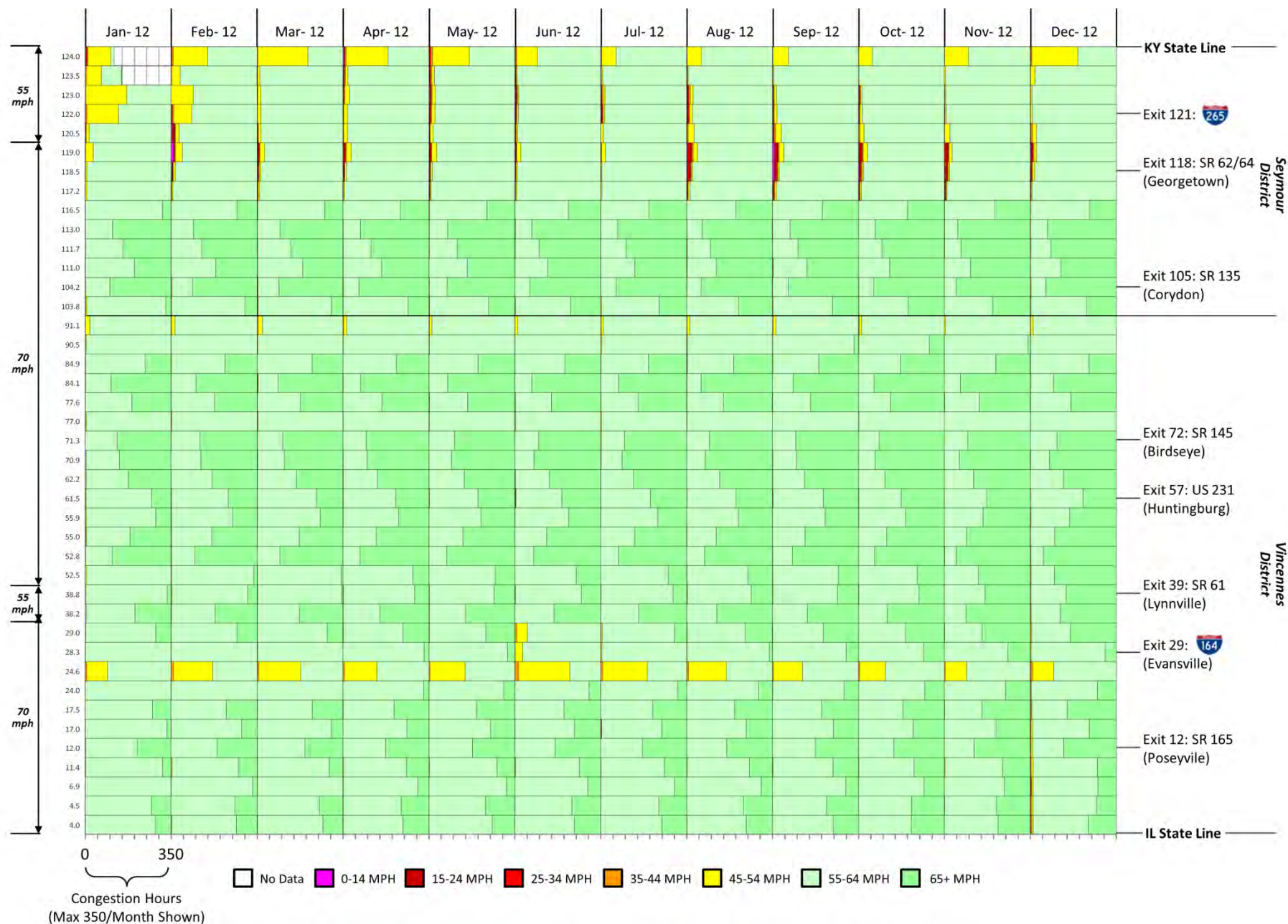


Figure A.18. Eastbound I-64 speed profile, 2012.

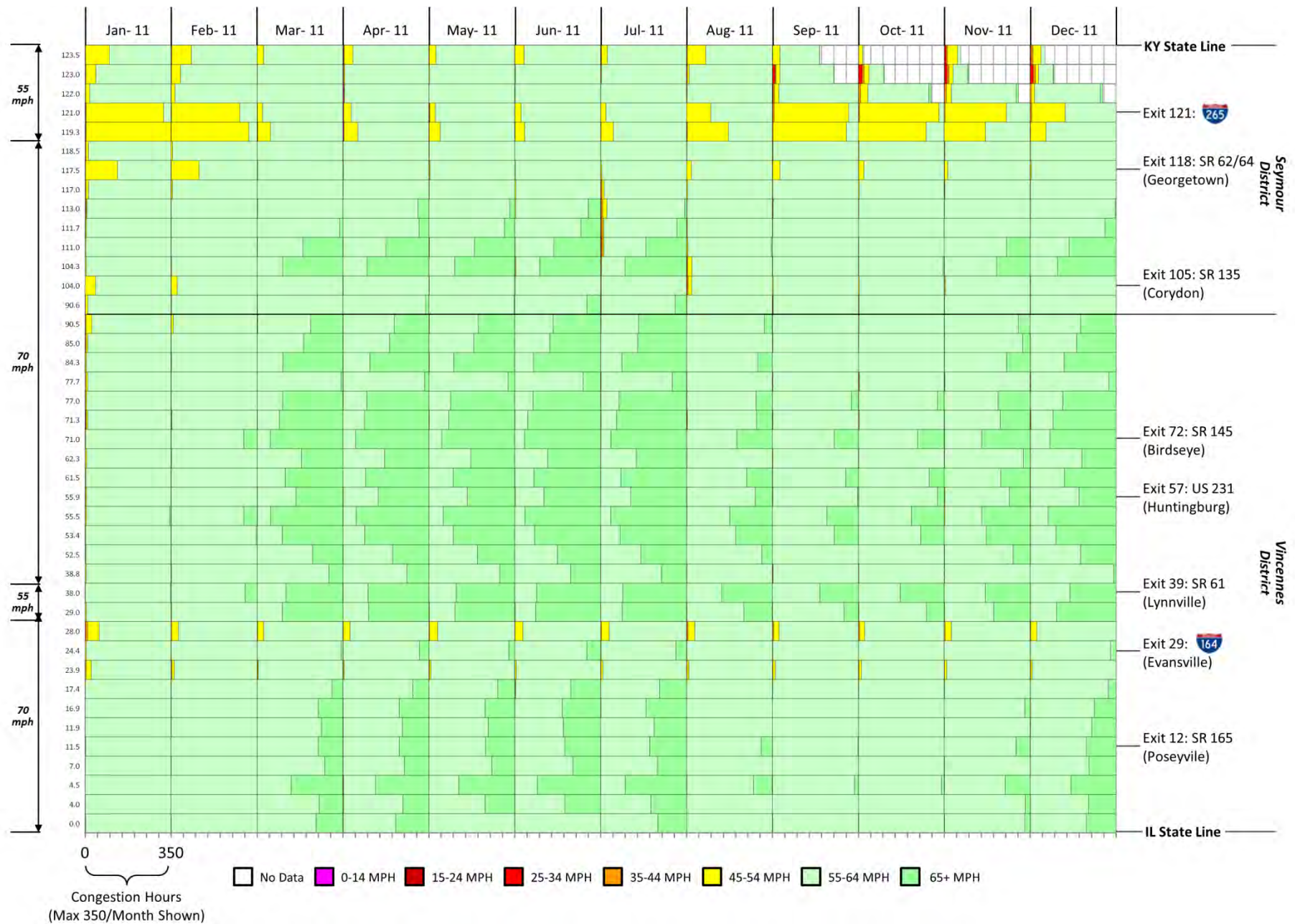


Figure A.19. Westbound I-64 speed profile, 2011.



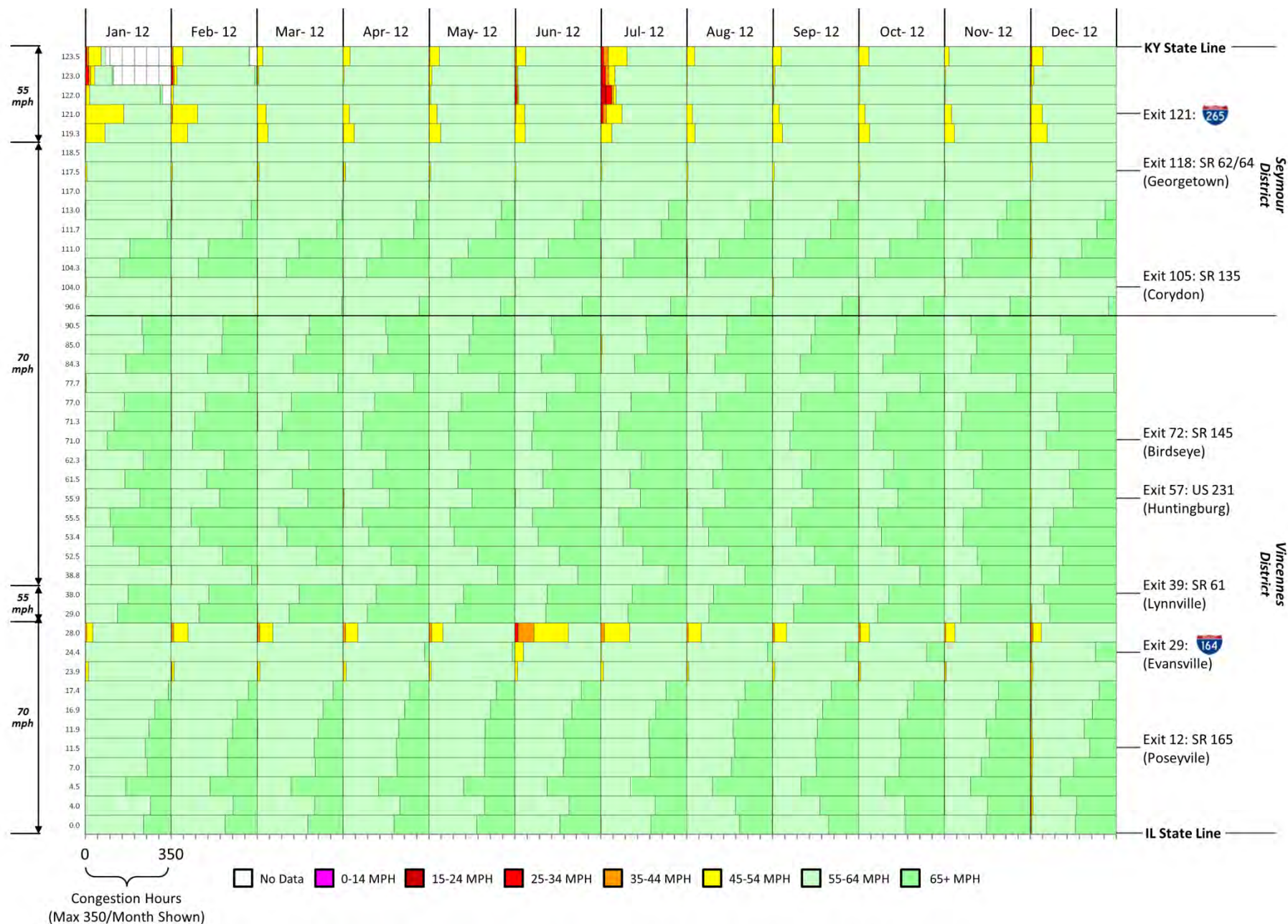


Figure A.20. Westbound I-64 speed profile, 2012.

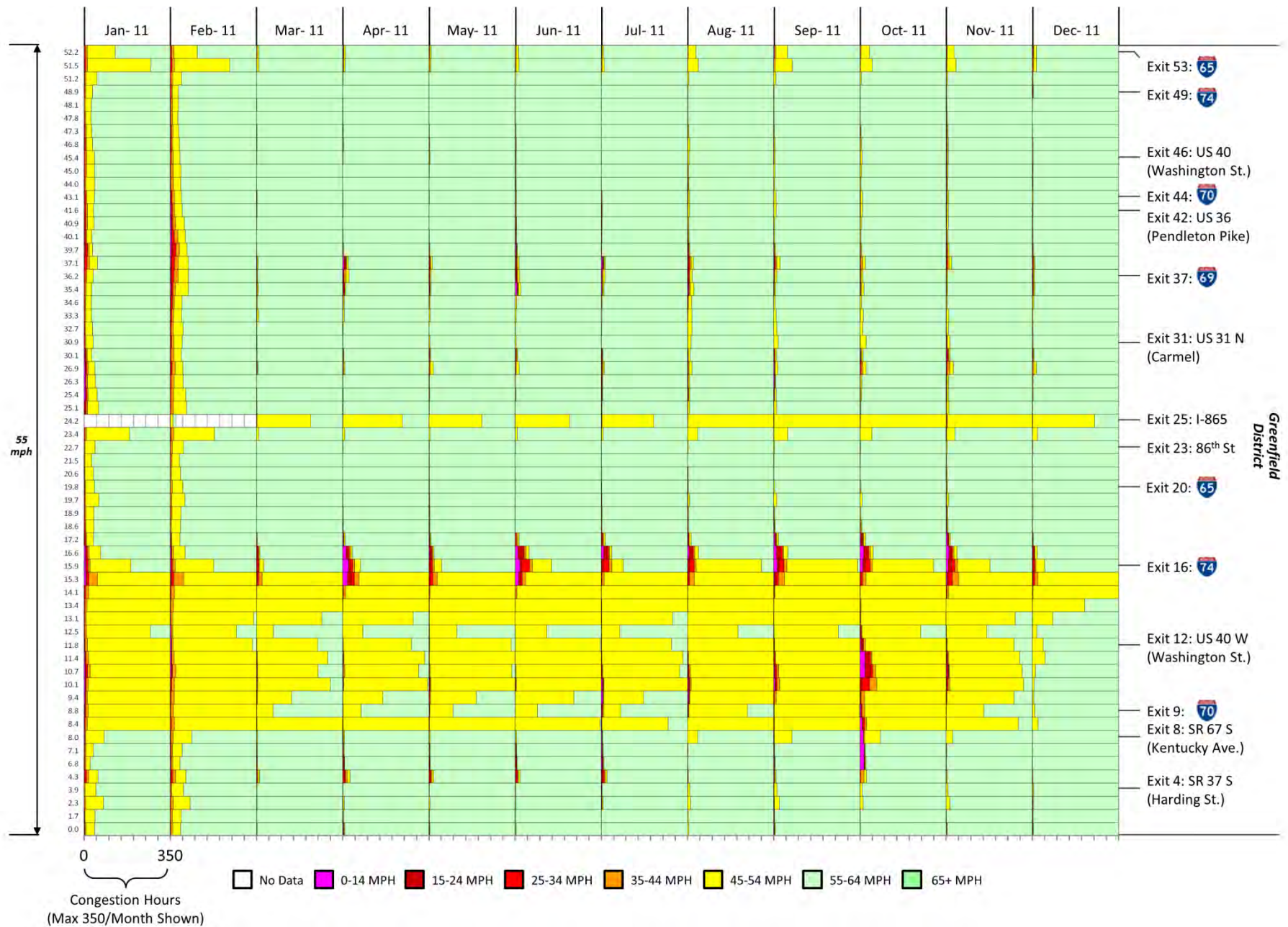


Figure A.21. Outer loop I-465 speed profile, 2011.





Figure A.22. Outer loop I-465 speed profile, 2012.

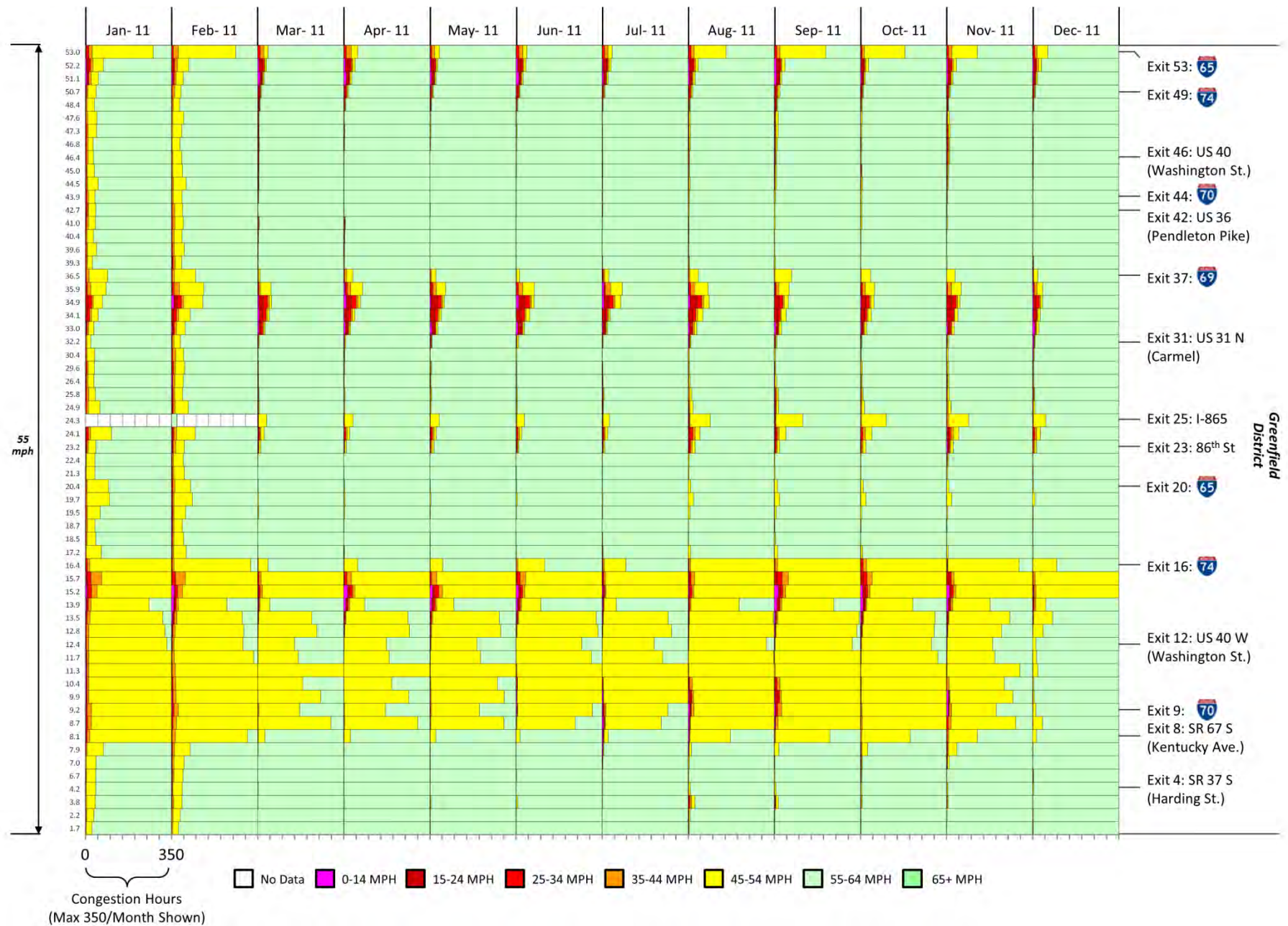


Figure A.23. Inner loop I-465 speed profile, 2011.



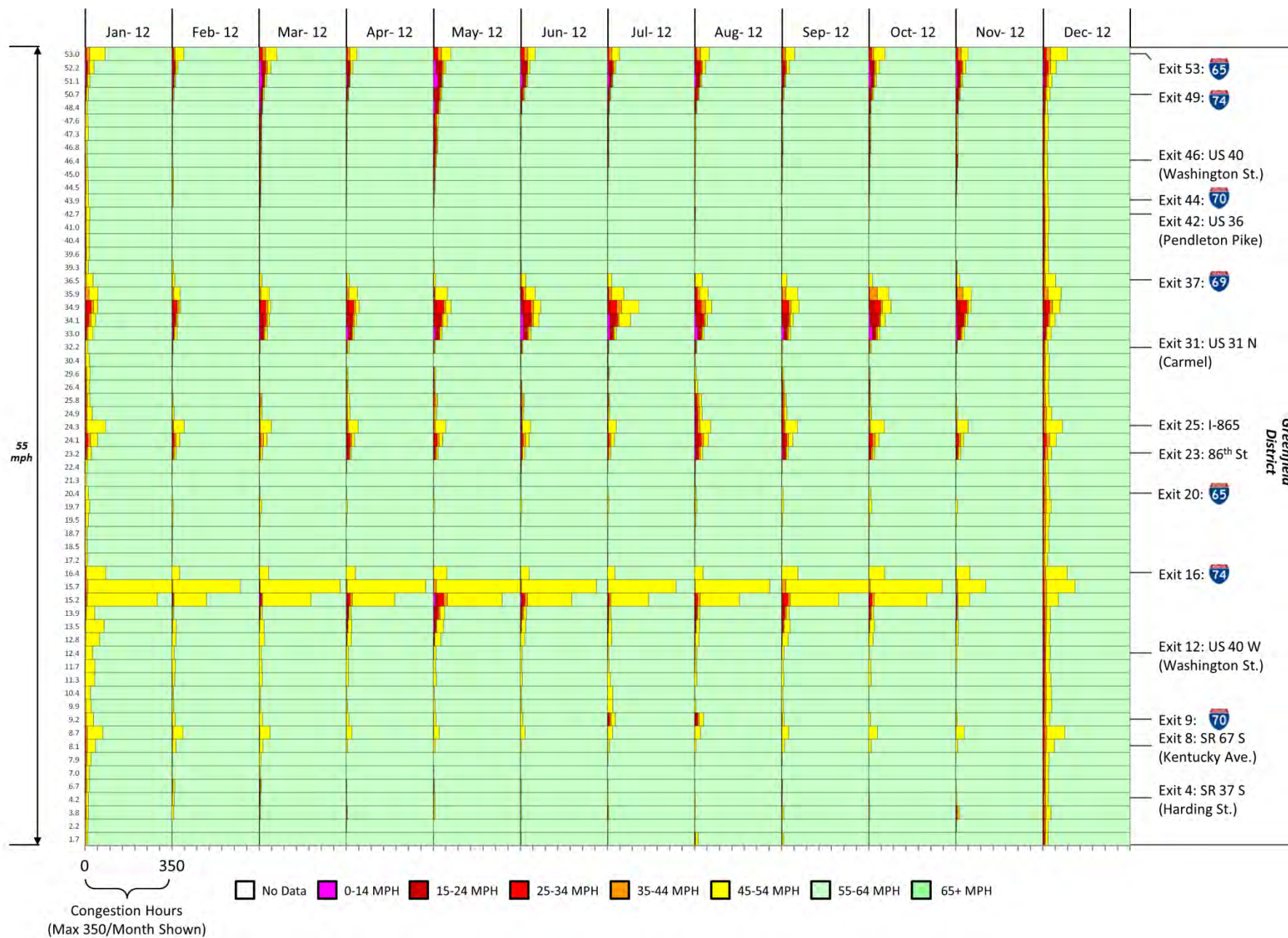


Figure A.24. Inner loop I-465 speed profile, 2012.

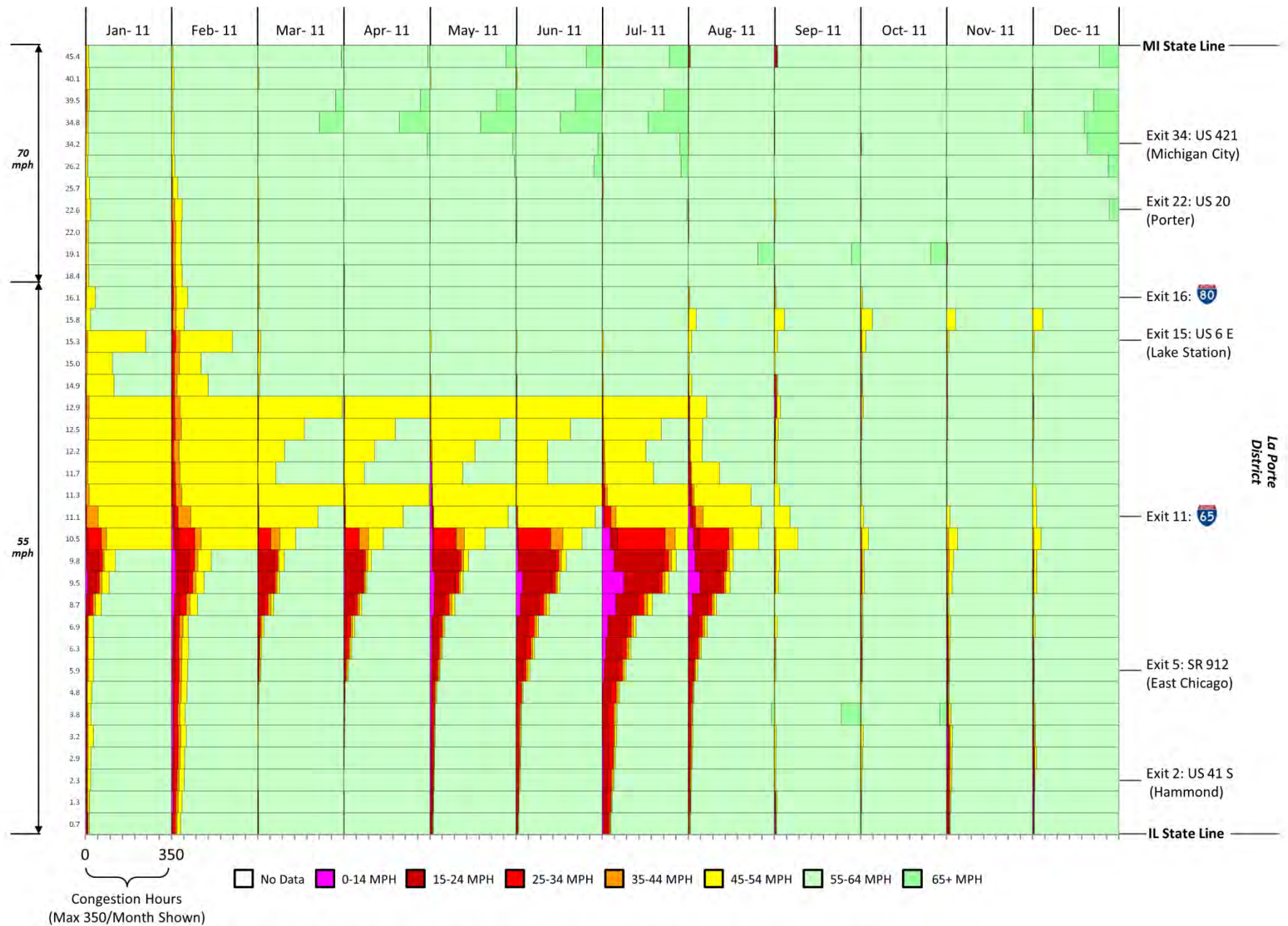


Figure A.25. Eastbound I-94 speed profile, 2011.



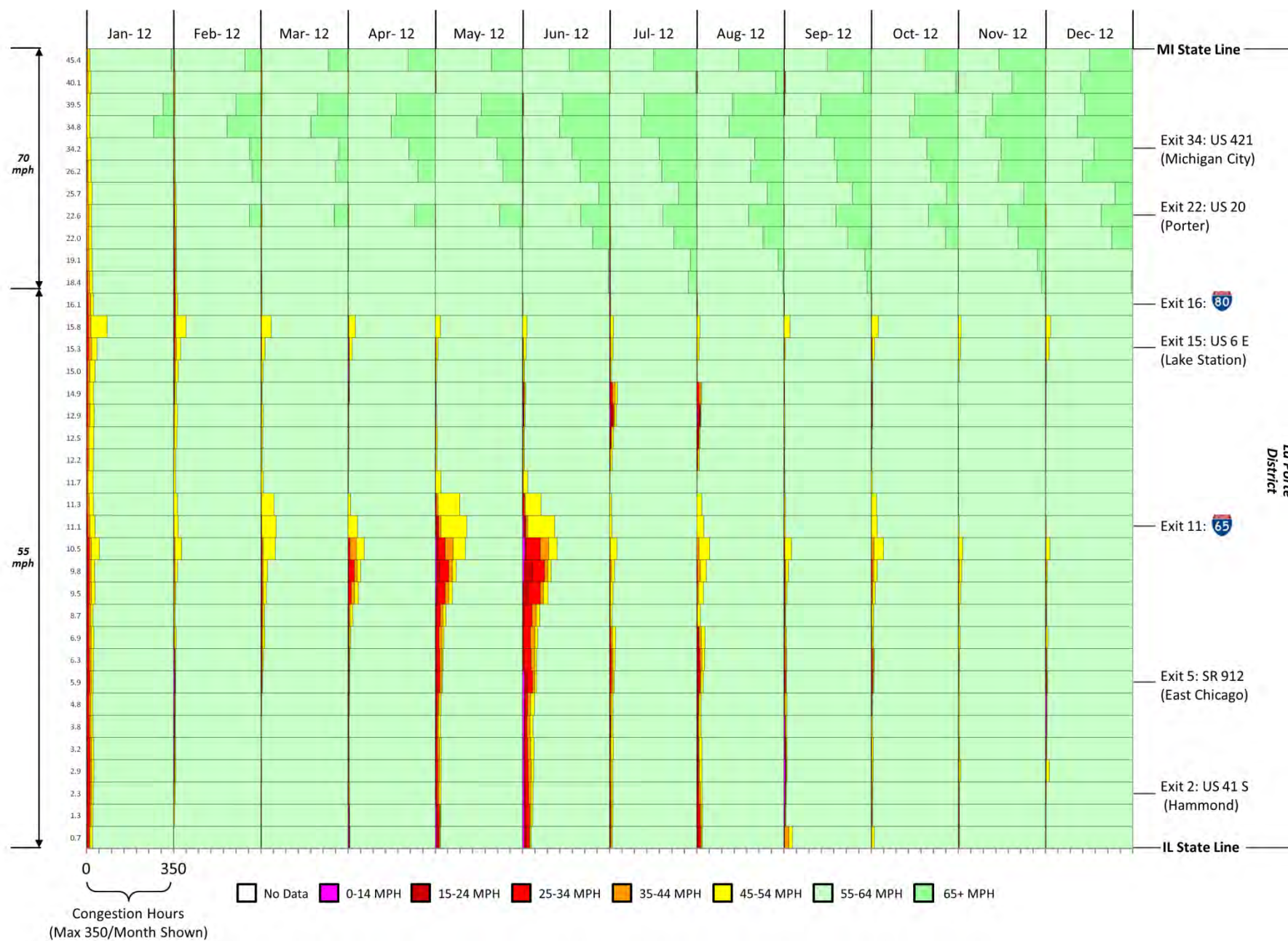


Figure A.26. Eastbound I-94 speed profile, 2012.

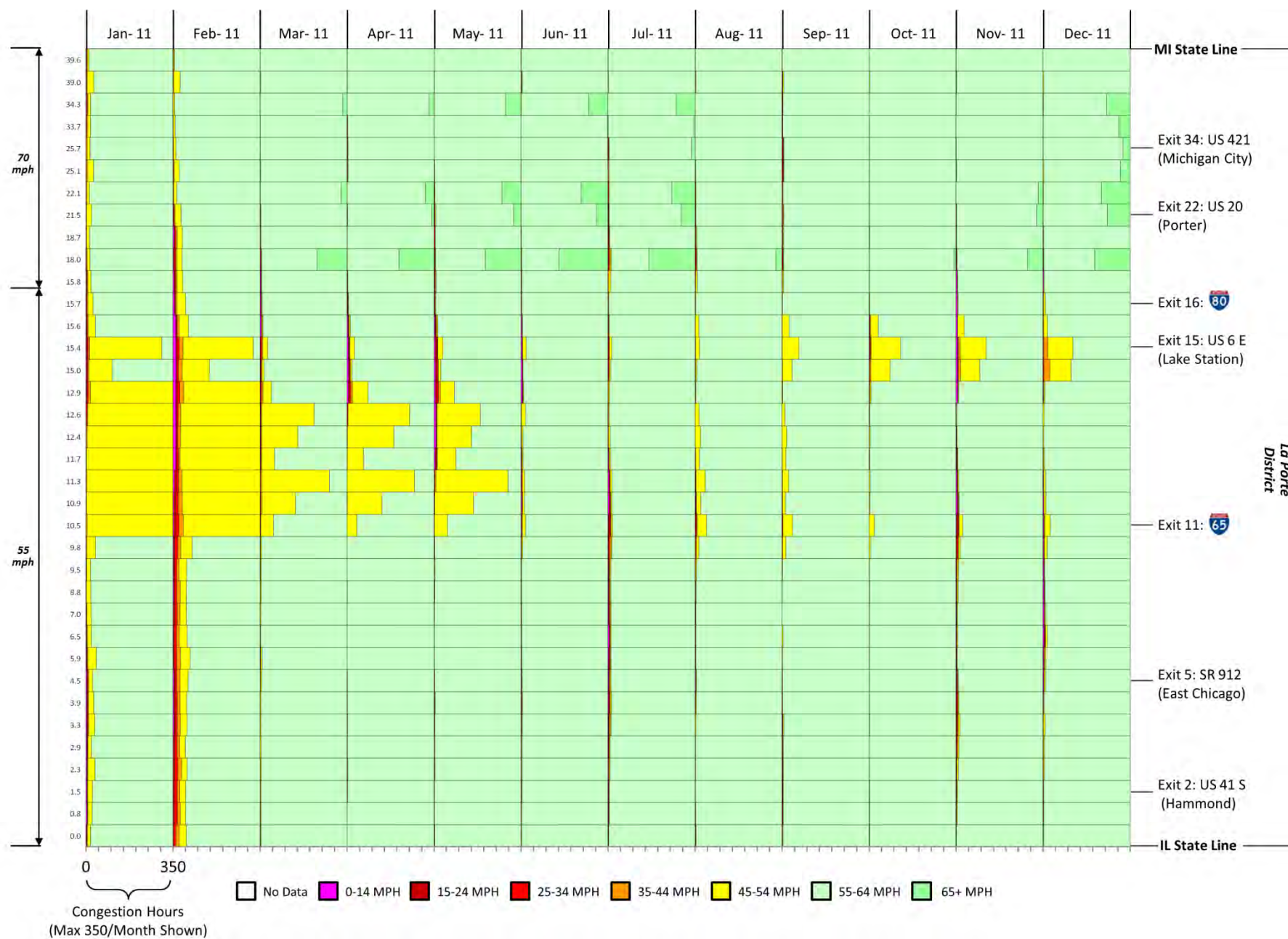


Figure A.27. Westbound I-94 speed profile, 2011.



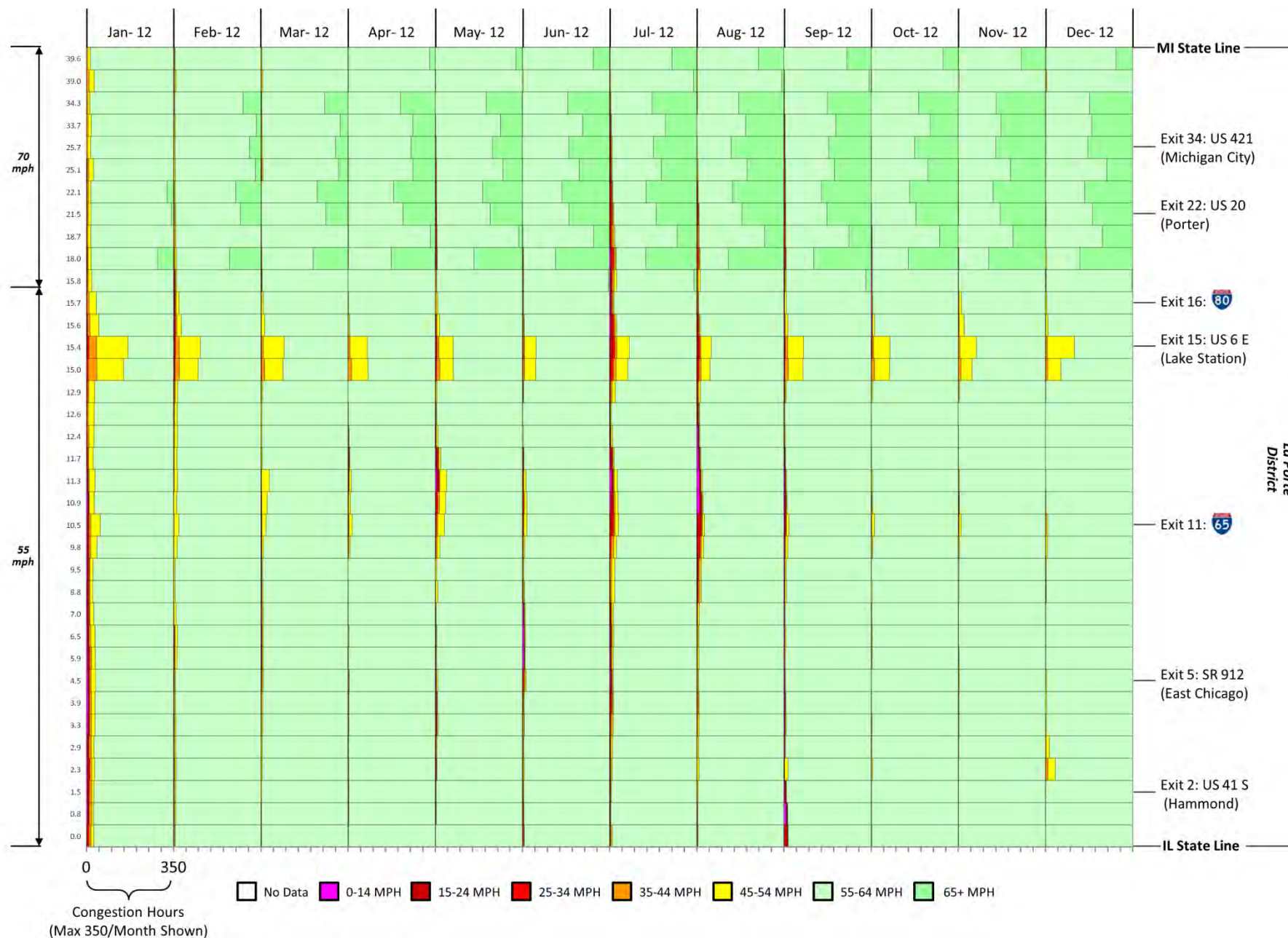
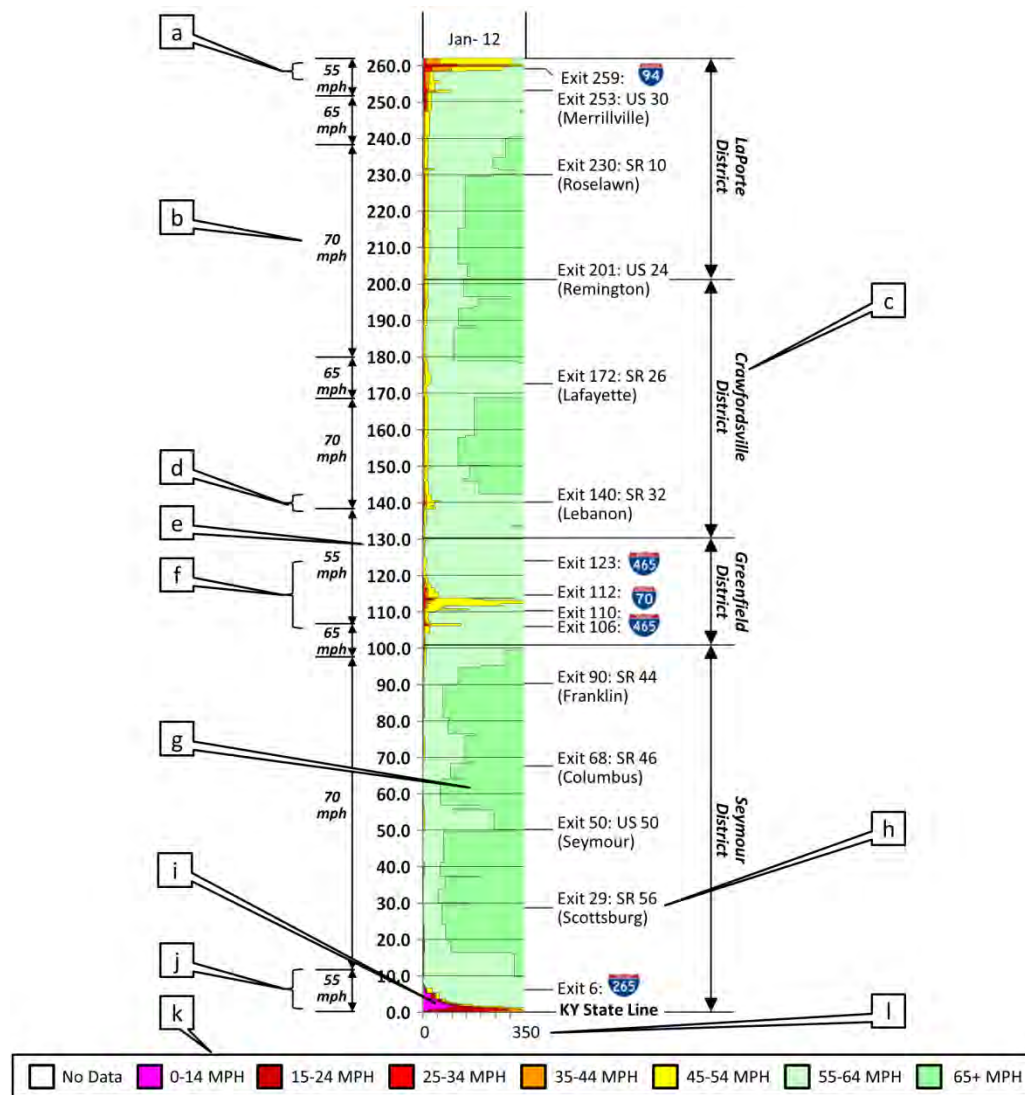


Figure A.28. Westbound I-94 speed profile, 2012.



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## Appendix B: 2011 & 2012 Interstate Speed Profiles with Linear Distance Scale



**Summary:** The data in the speed profile can be further refined by scaling the segment data to a linear milepost scale. The primary x-axis remains the same as in Appendix A, while the y-axis reflects the length of the segment.

- a. Gary area.
- b. Demarcation of speed limits.
- c. Locations of INDOT district jurisdictions.
- d. Lebanon area.
- e. Mile markers of each segment.
- f. Indianapolis area.
- g. Example of low congestion (65+ mph).
- h. Locations of interchanges by exit/mile marker number.
- i. Example of high congestion (0-14 mph).
- j. Louisville area.
- k. Scale showing speed bins.
- l. Maximum scale set to 350 hours per month.

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## Table of Figures








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	Indiana Interstate 70	86
	Indiana Interstate 69	90
	Indiana Interstate 64	94
	Indiana Interstate 465	98
	Indiana Interstate 94	102



Figure B.1. Southbound I-65 scaled speed profile, 2011.





Figure B.2. Southbound I-65 scaled speed profile, 2012.



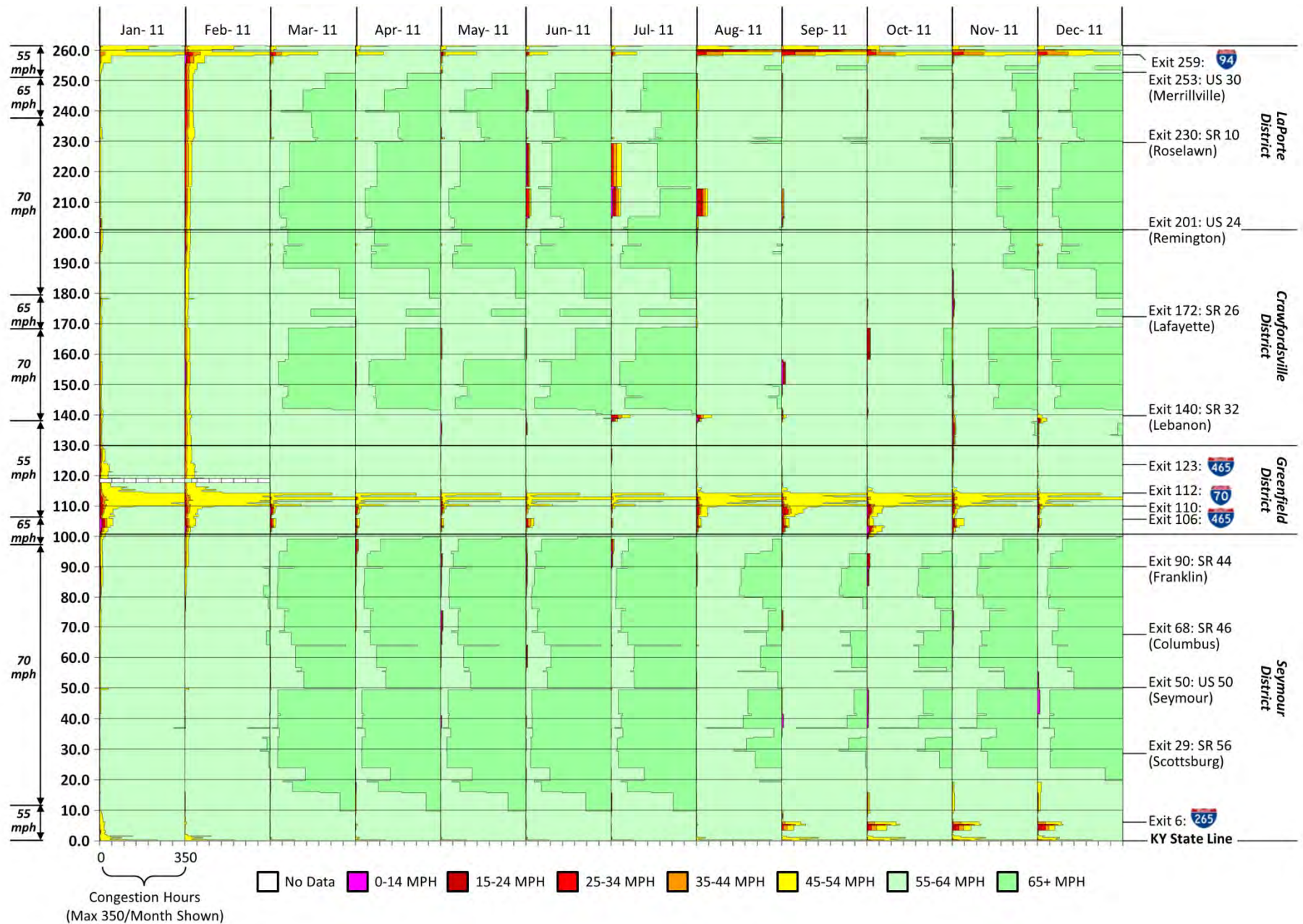


Figure B.3. Northbound I-65 scaled speed profile, 2011.

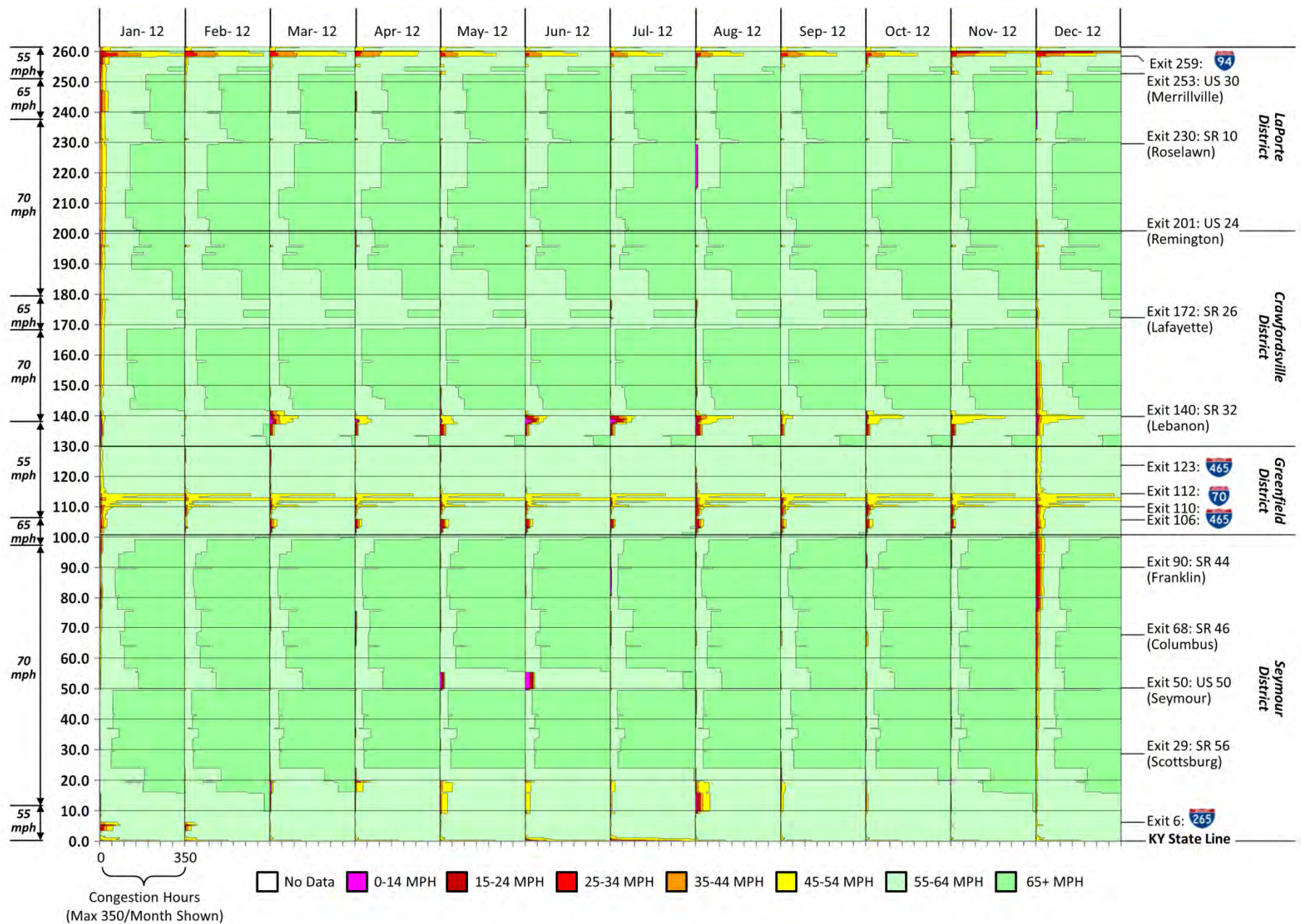


Figure B.4. Northbound I-65 scaled speed profile, 2012.





Figure B.5. Eastbound I-74 scaled speed profile, 2011.





Figure B.6. Eastbound I-74 scaled speed profile, 2012.

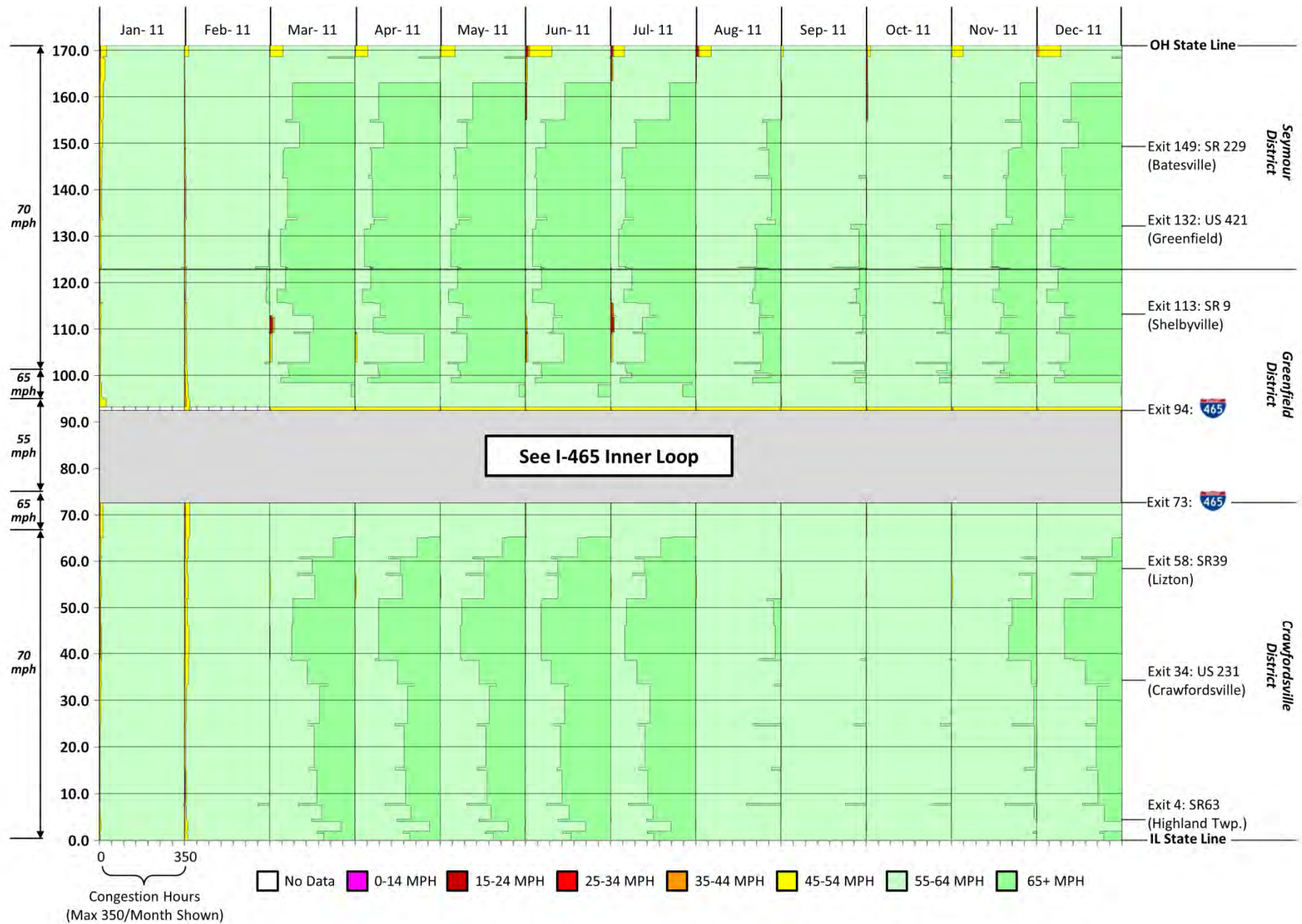


Figure B.7. Westbound I-74 scaled speed profile, 2011.



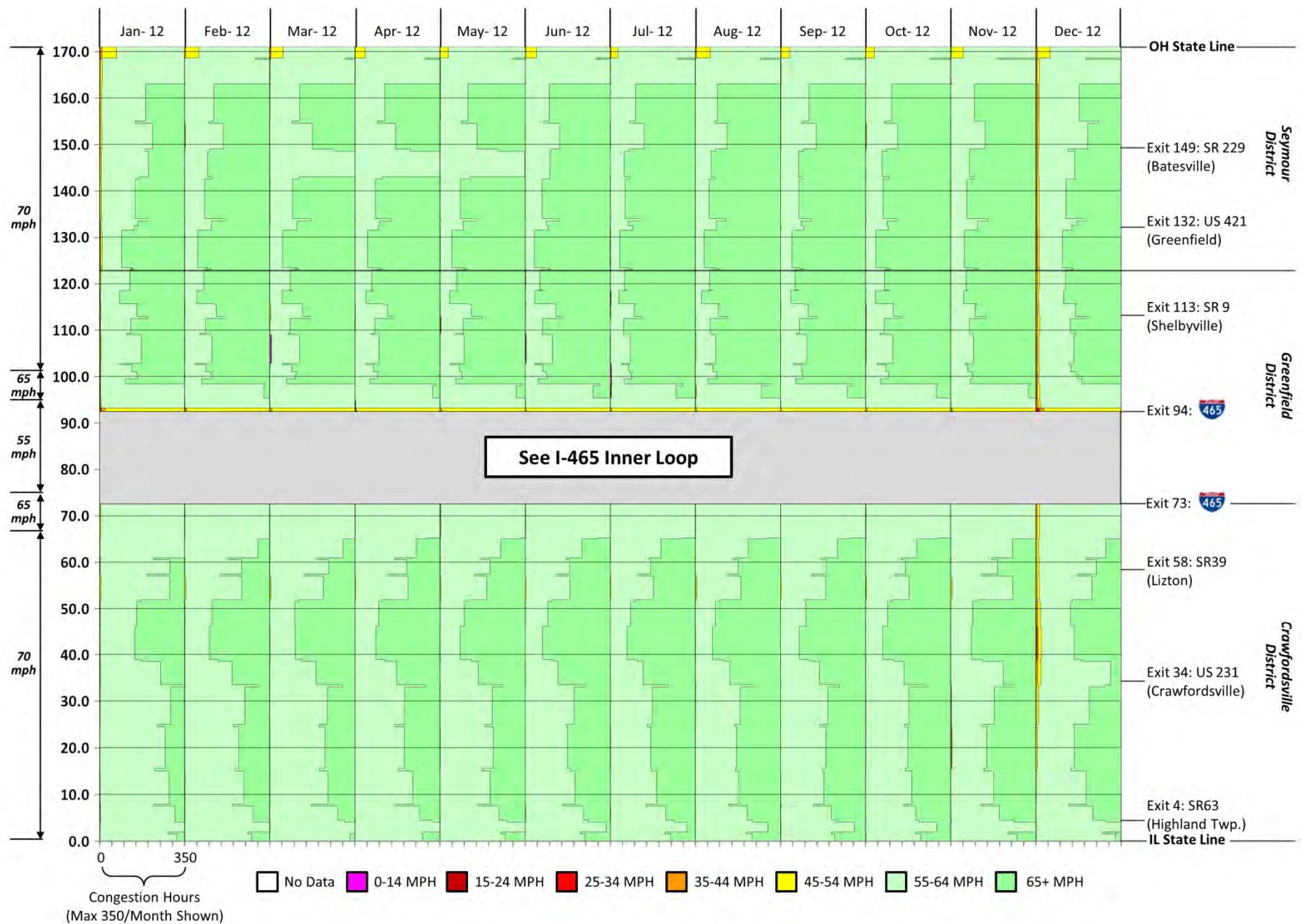


Figure B.8. Westbound I-74 scaled speed profile, 2012.



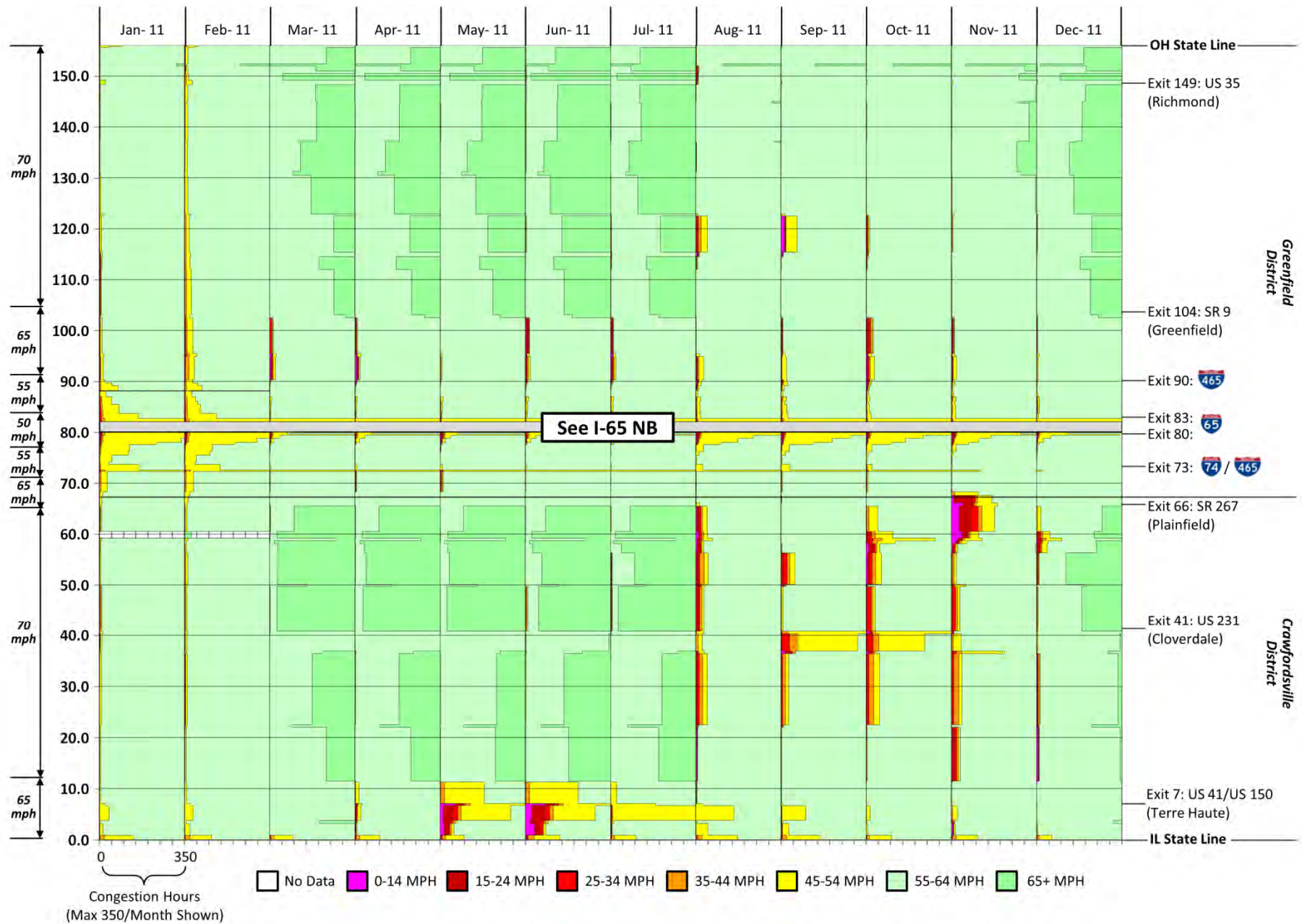


Figure B.9. Eastbound I-70 scaled speed profile, 2011.

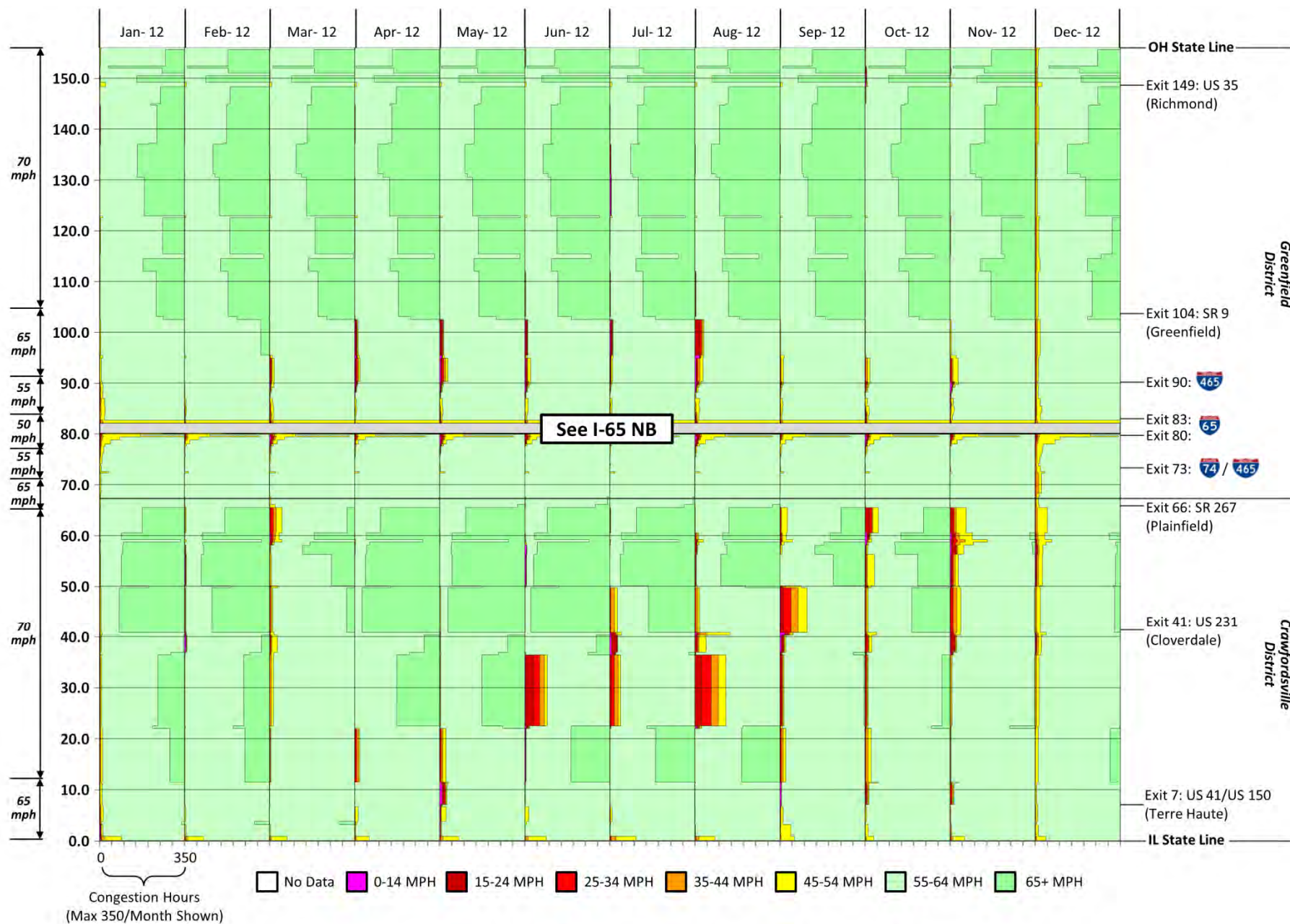


Figure B.10. Eastbound I-70 scaled speed profile, 2012.



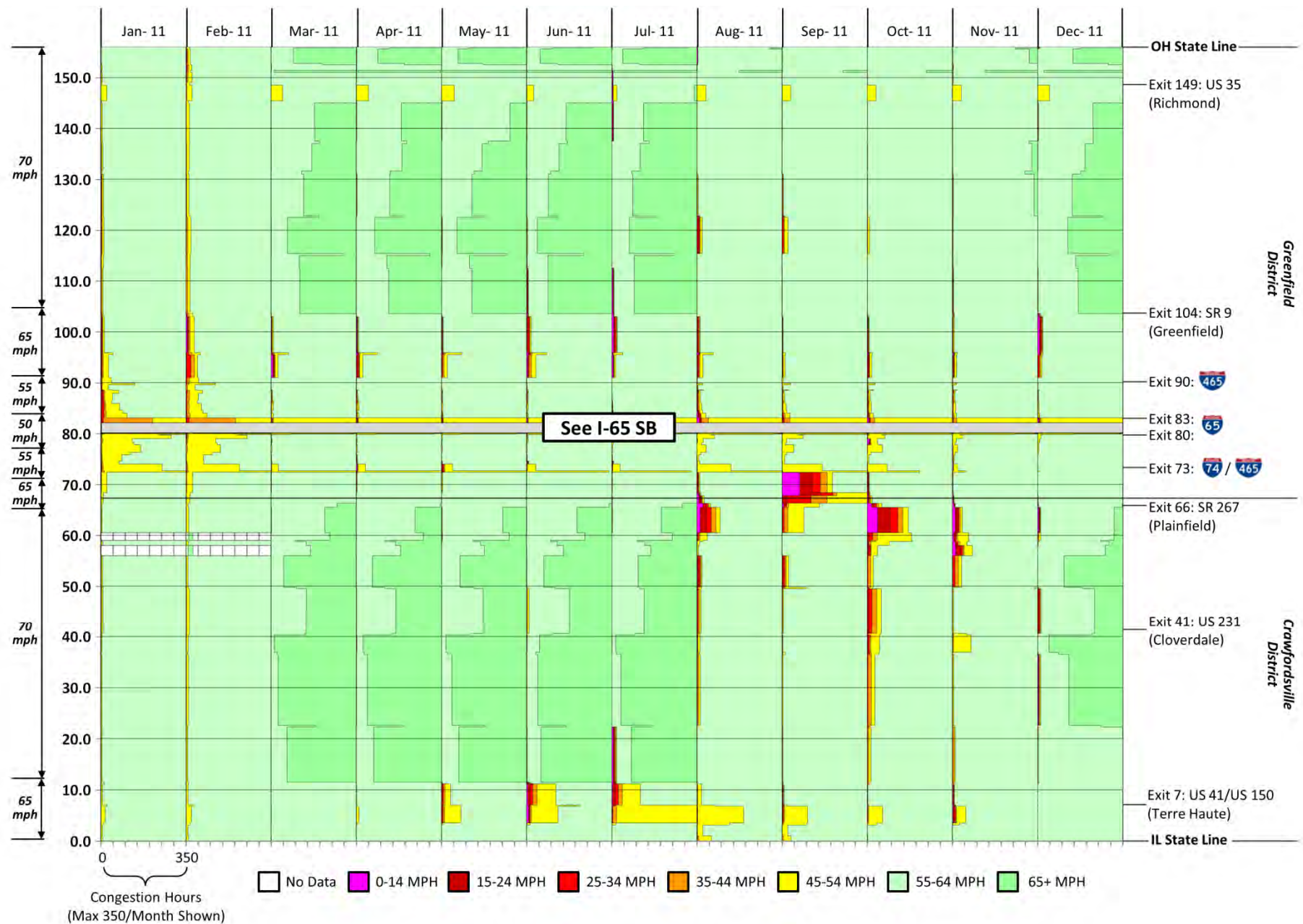


Figure B.11. Westbound I-70 scaled speed profile, 2011.



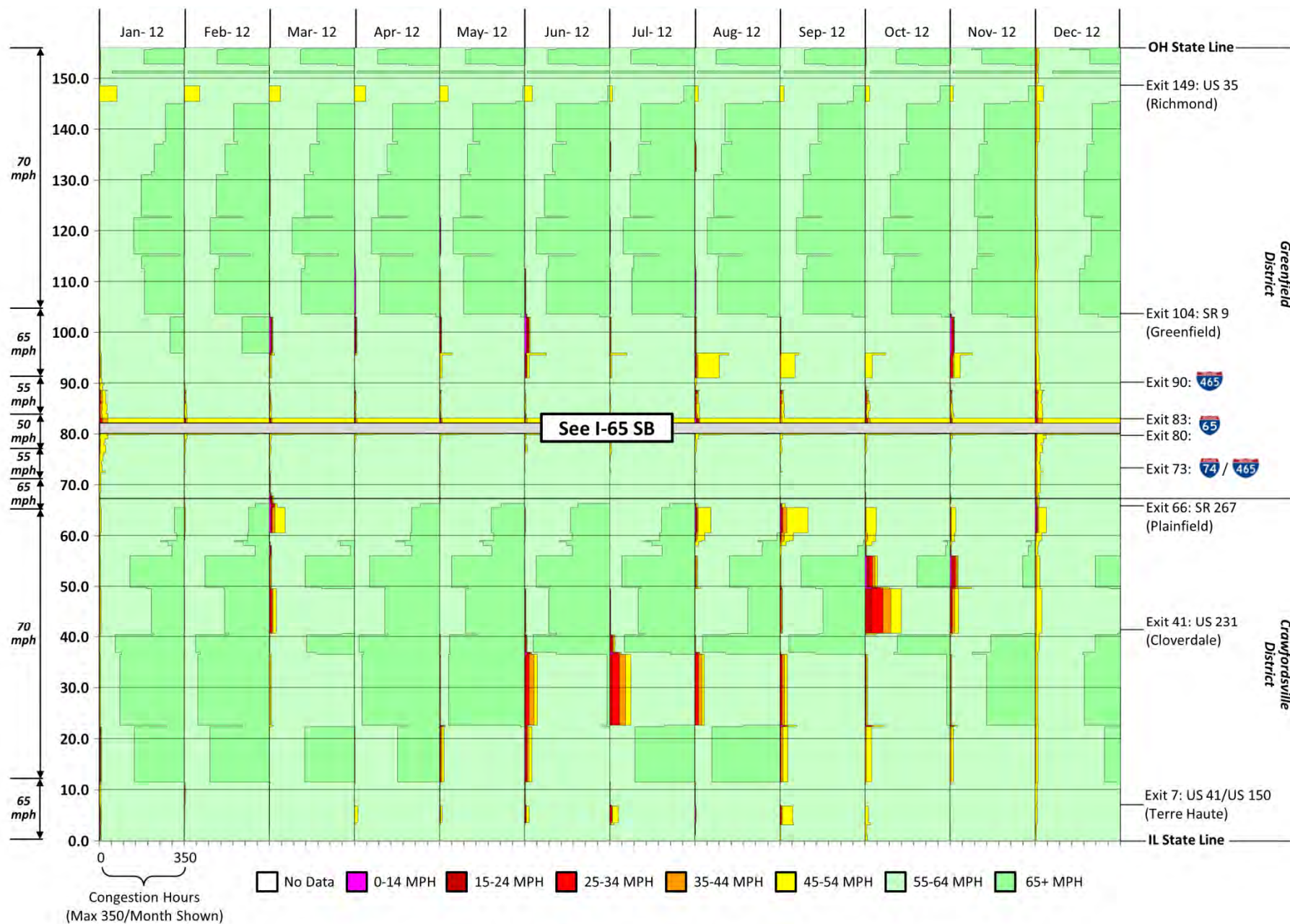


Figure B.12. Westbound I-70 scaled speed profile, 2012.

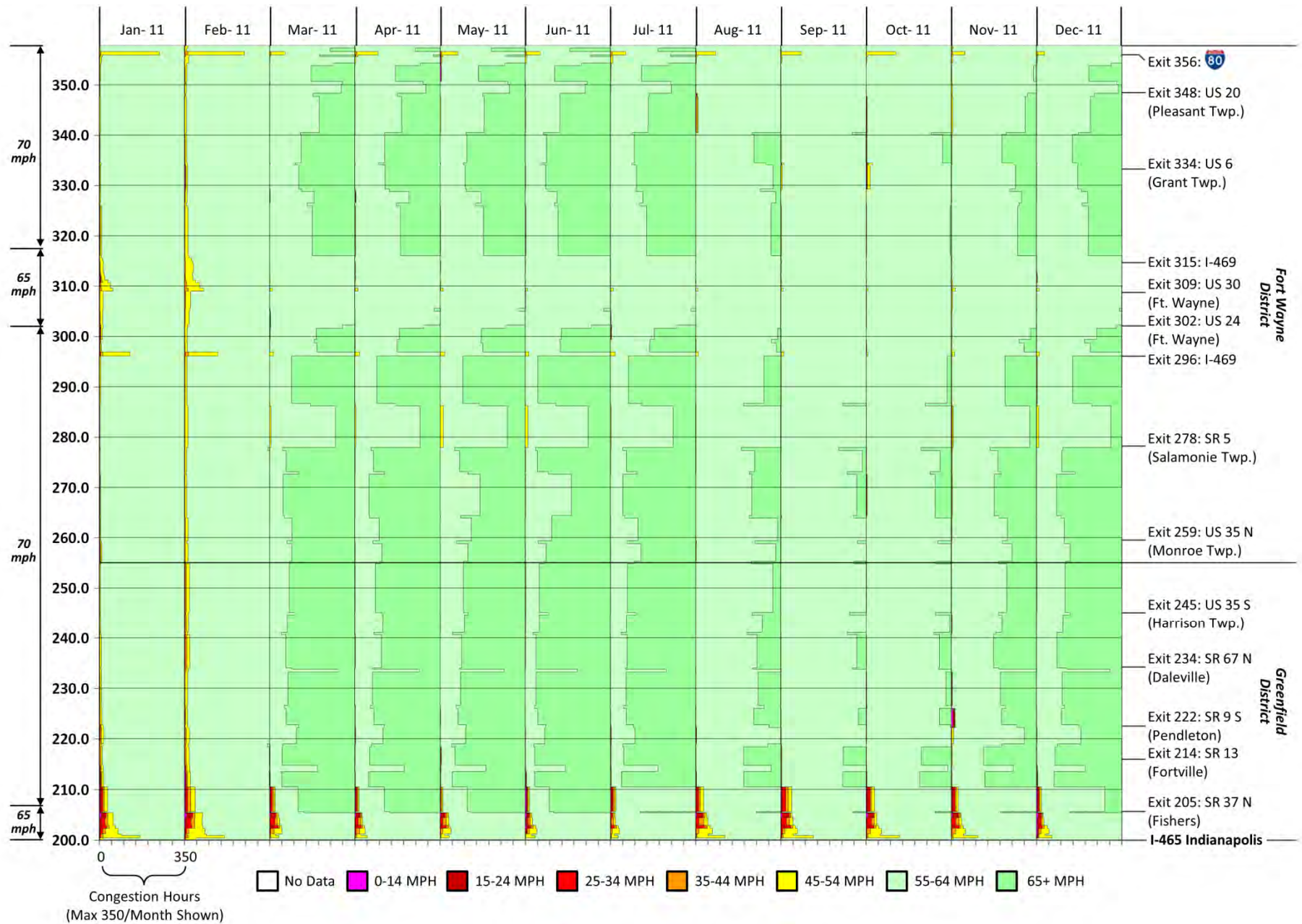


Figure B.13. Southbound I-69 scaled speed profile, 2011.



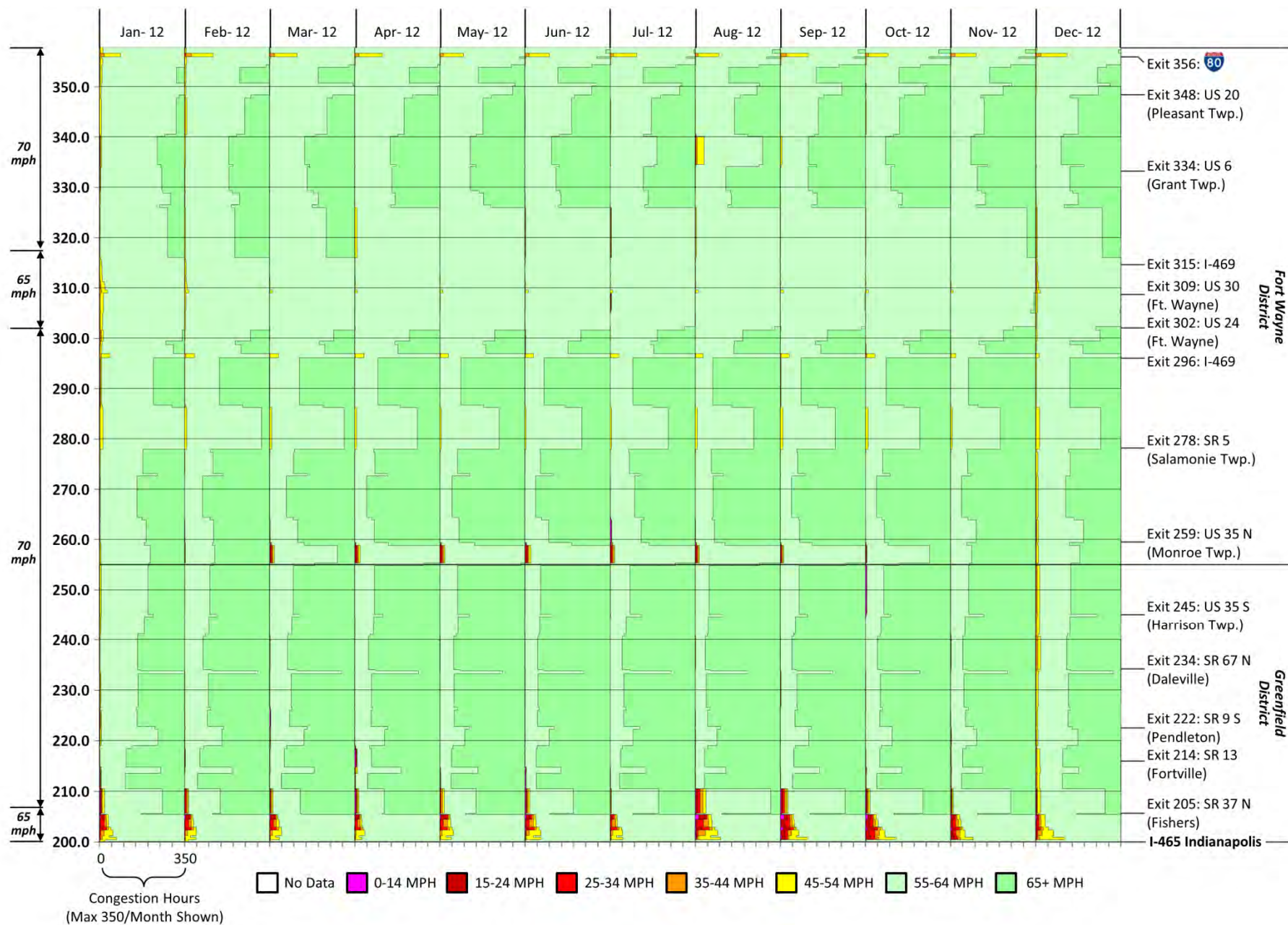


Figure B.14. Southbound I-69 scaled speed profile, 2012.



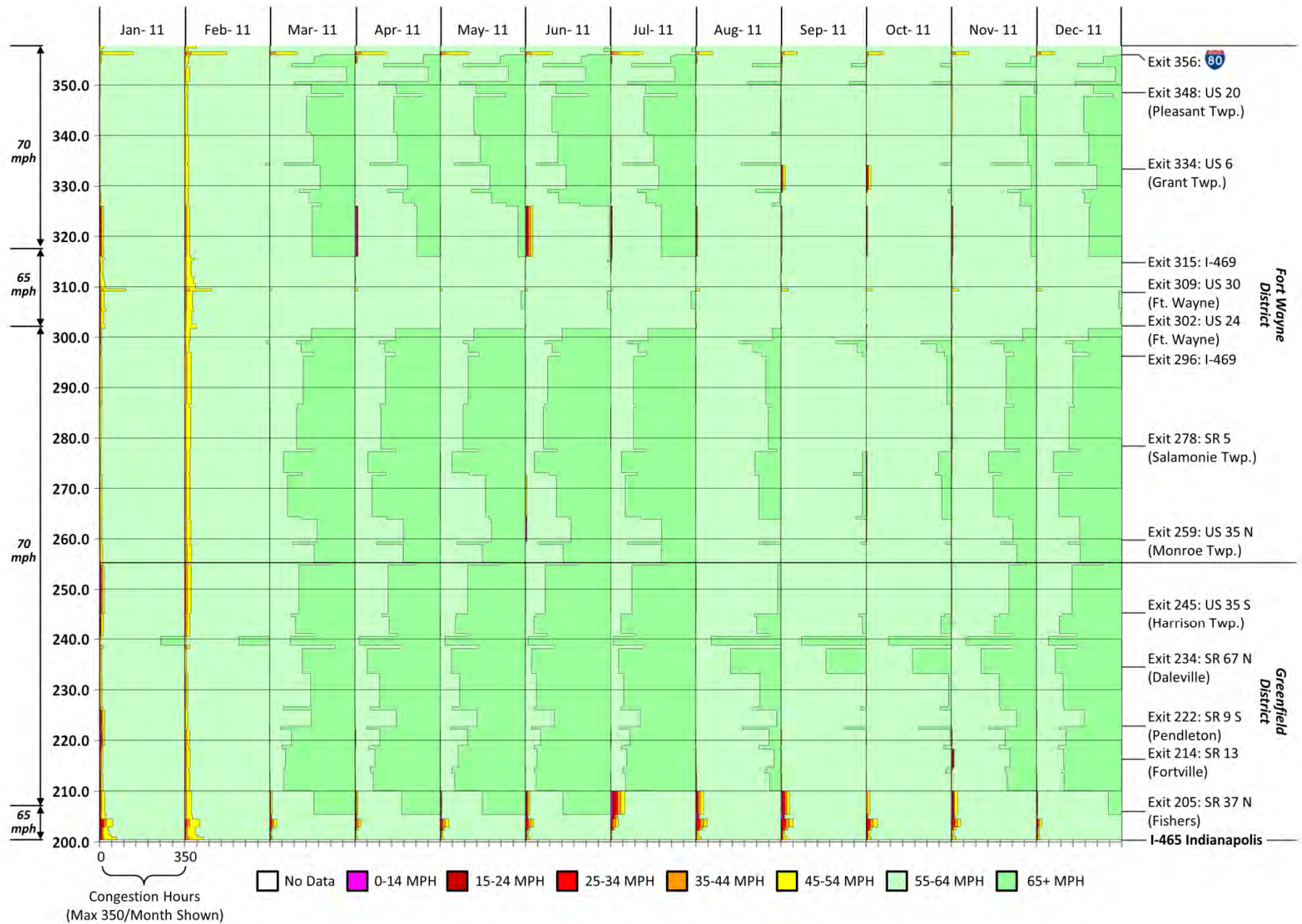


Figure B.15. Northbound I-69 scaled speed profile, 2011.

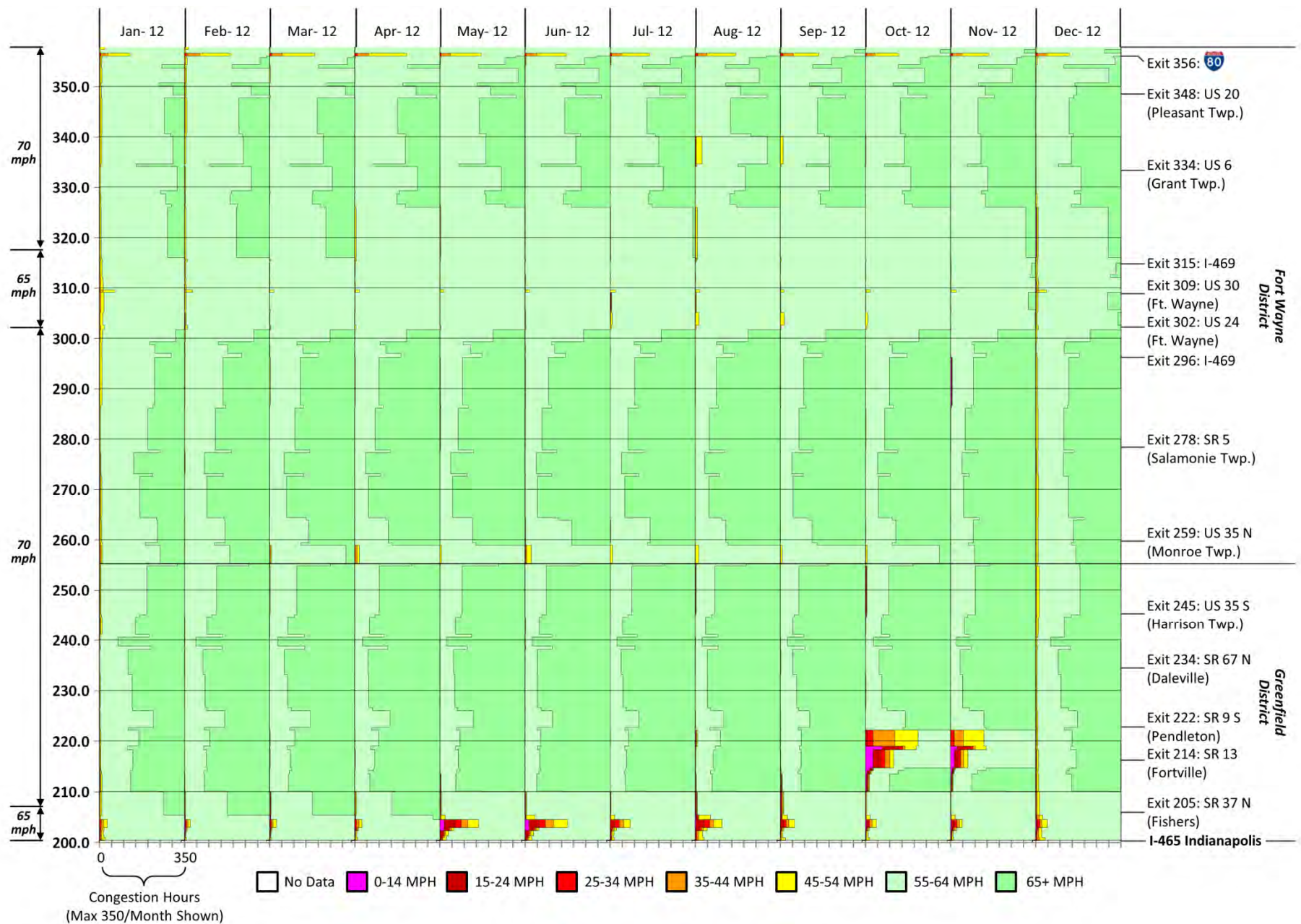


Figure B.16. Northbound I-69 scaled speed profile, 2012.



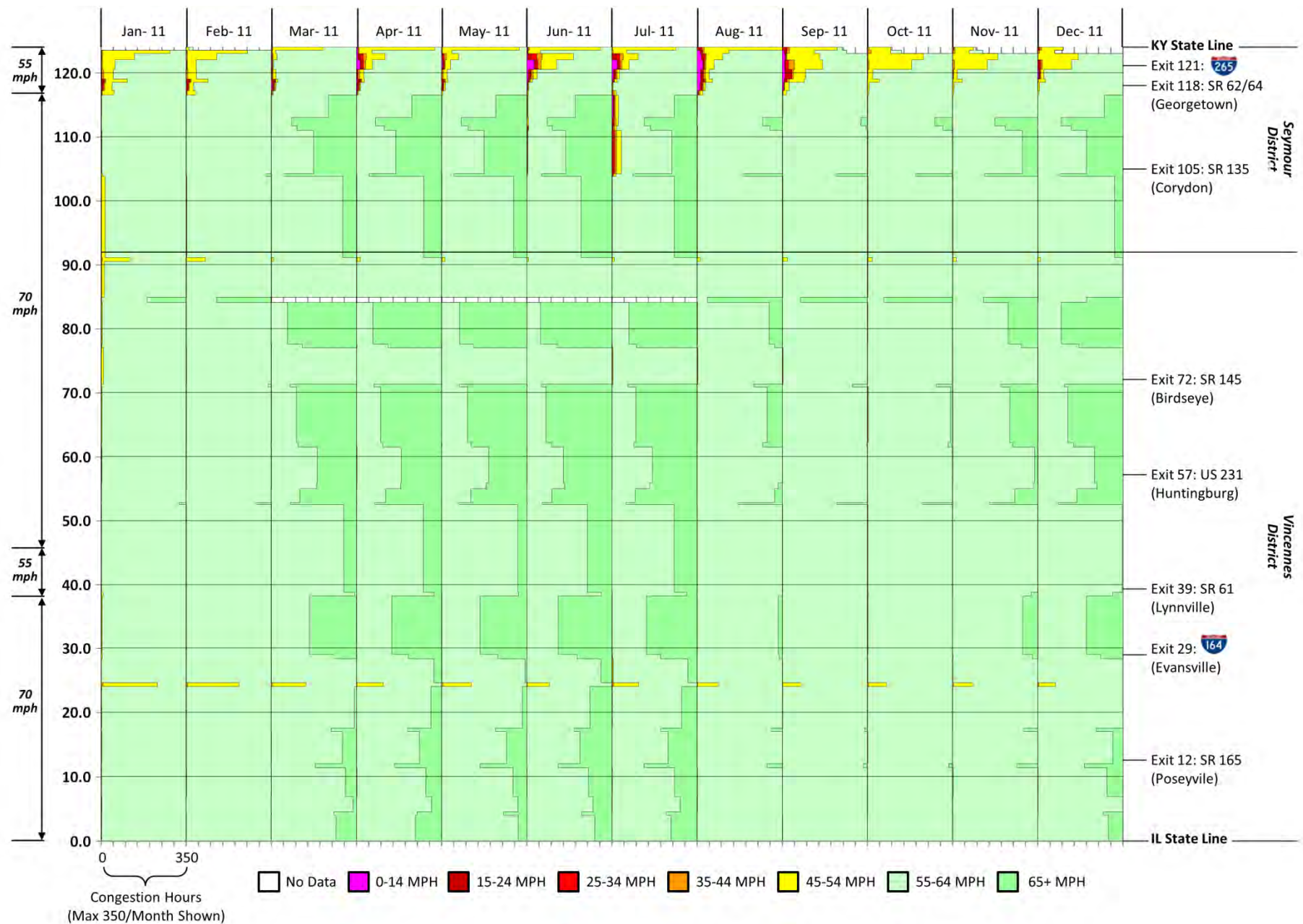


Figure B.17. Eastbound I-64 scaled speed profile, 2011.



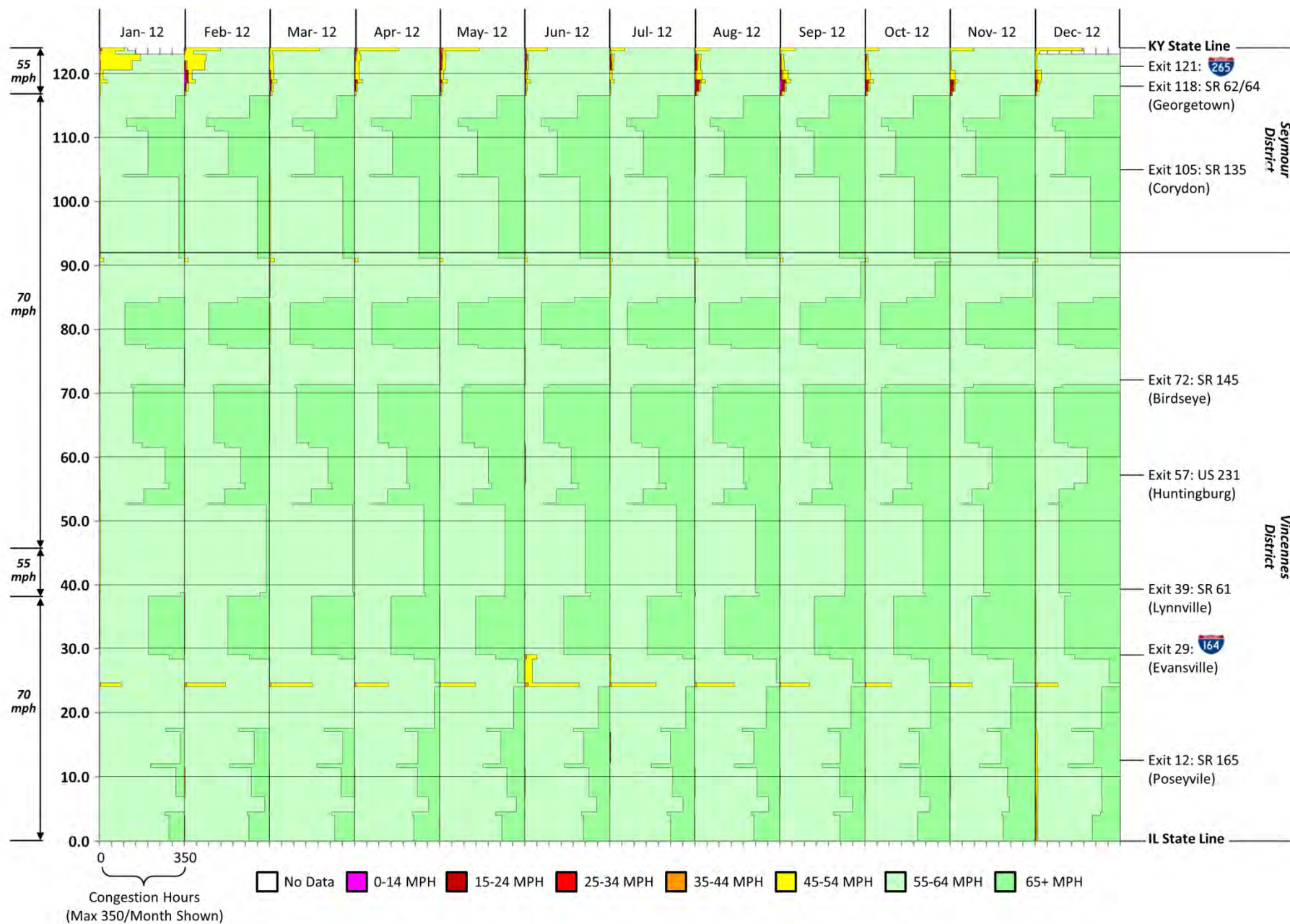


Figure B.18. Eastbound I-64 scaled speed profile, 2012.

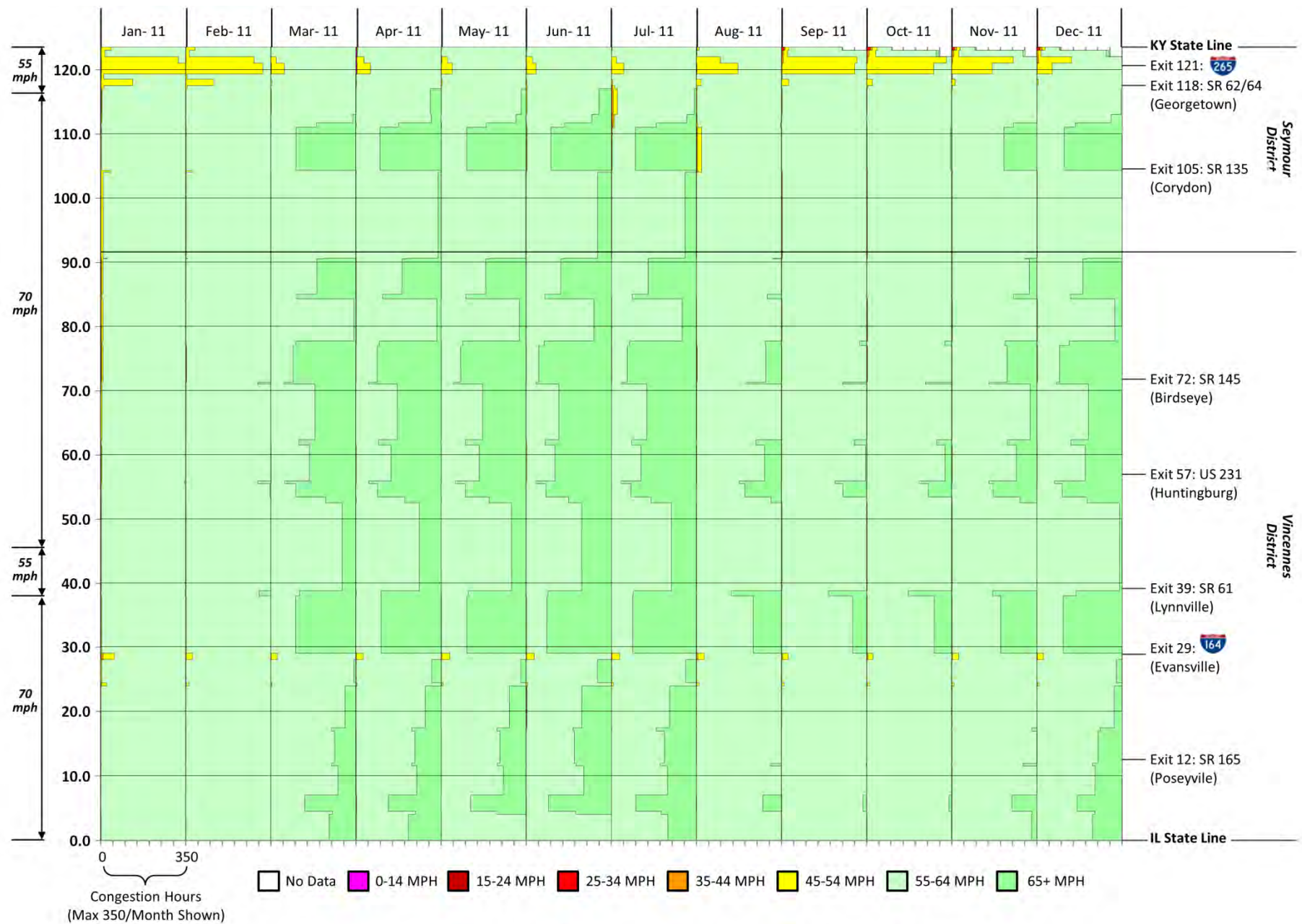


Figure B.19. Westbound I-64 scaled speed profile, 2011.



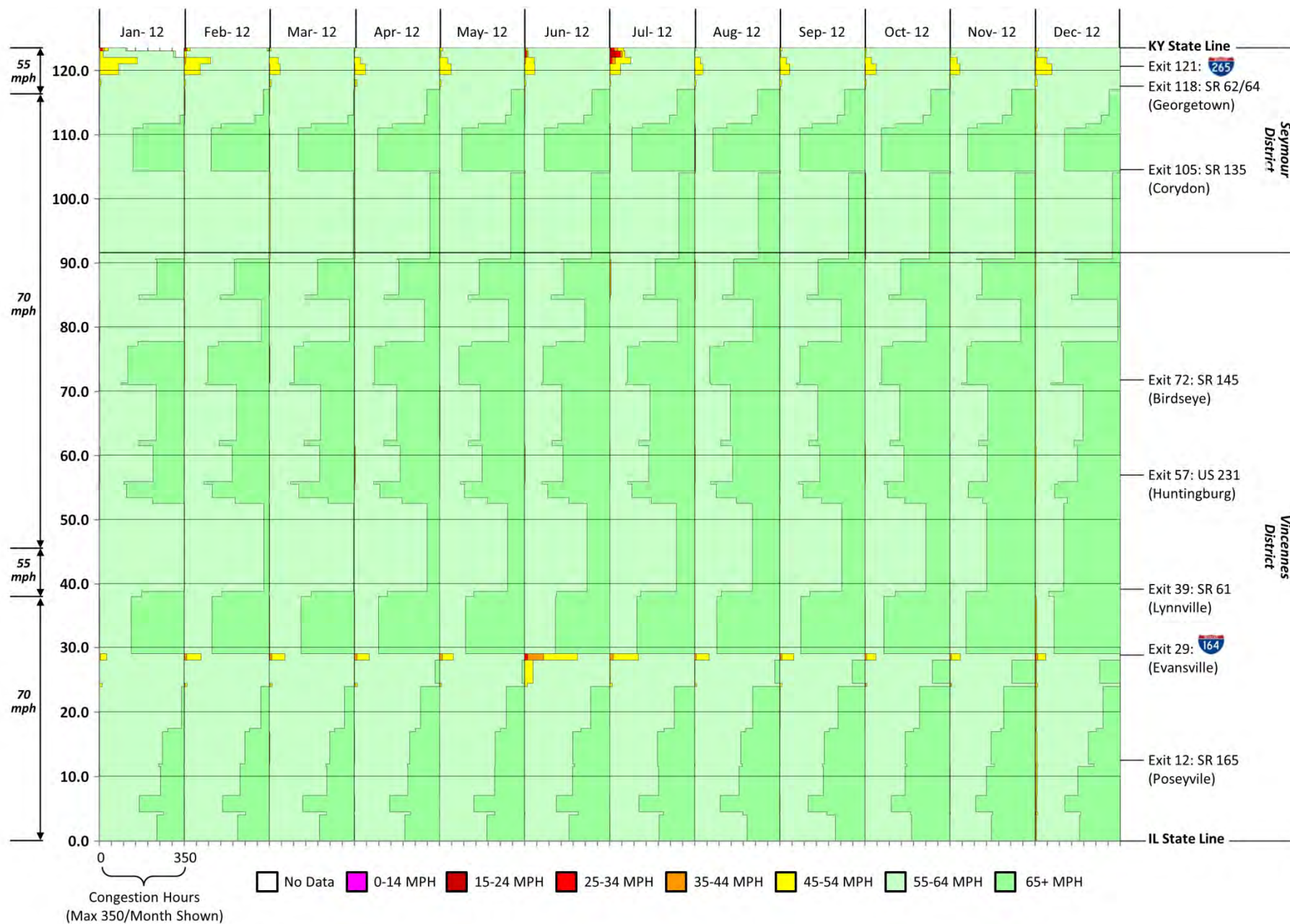


Figure B.20. Westbound I-64 scaled speed profile, 2012.



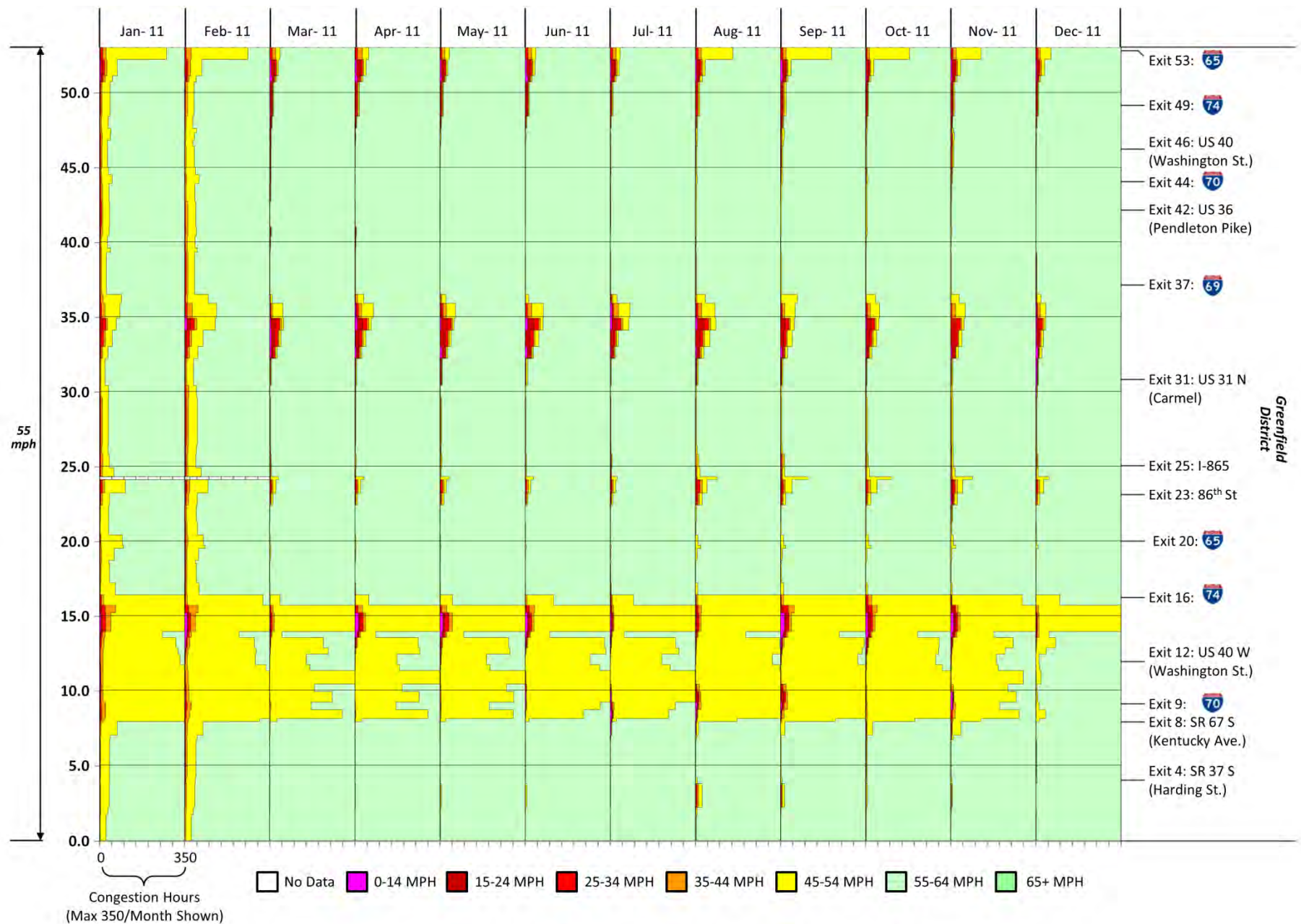


Figure B.21. Outer loop I-465 scaled speed profile, 2011.

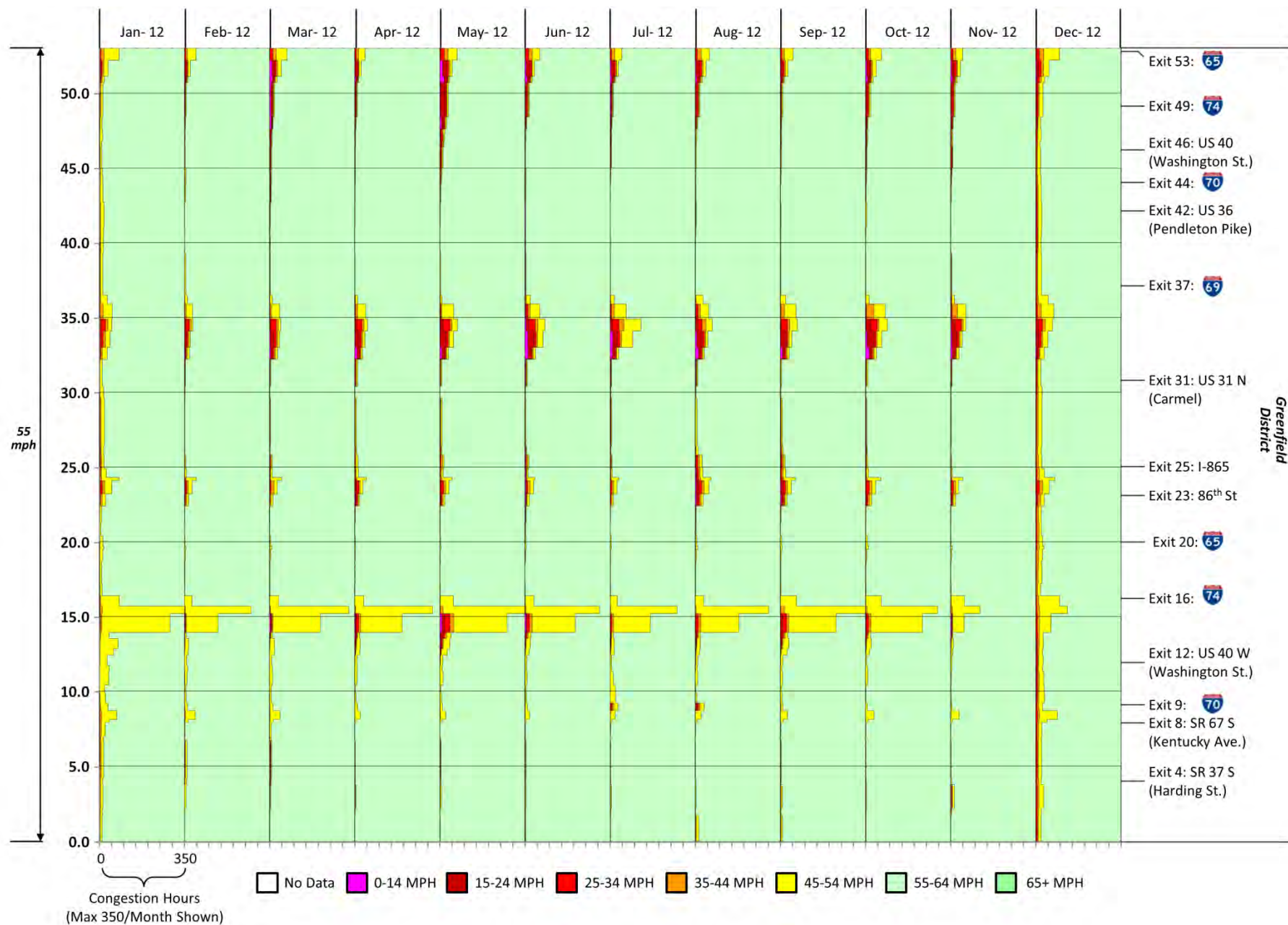


Figure B.22. Outer loop I-465 scaled speed profile, 2012.



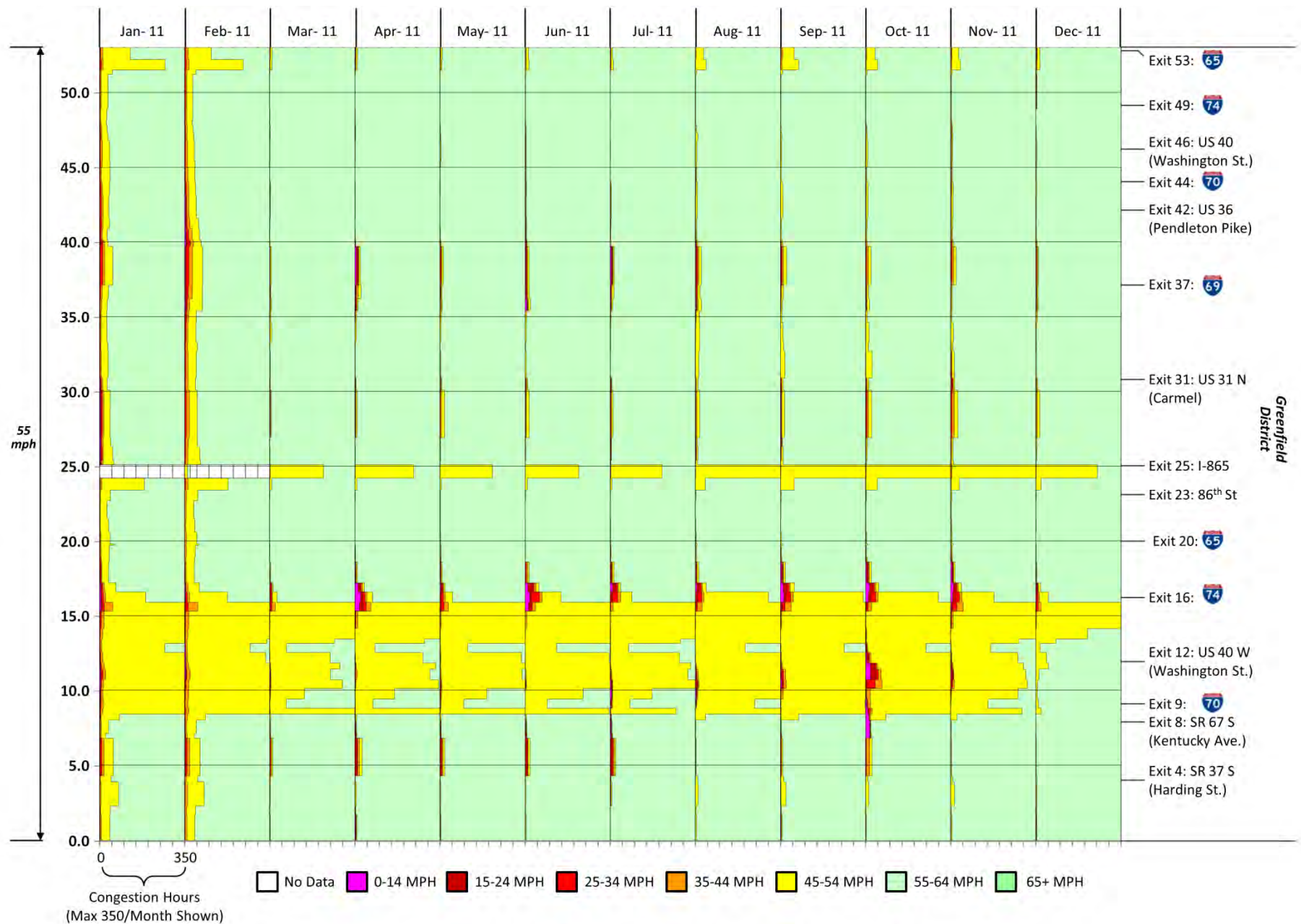


Figure B.23. Inner loop I-465 scaled speed profile, 2011.



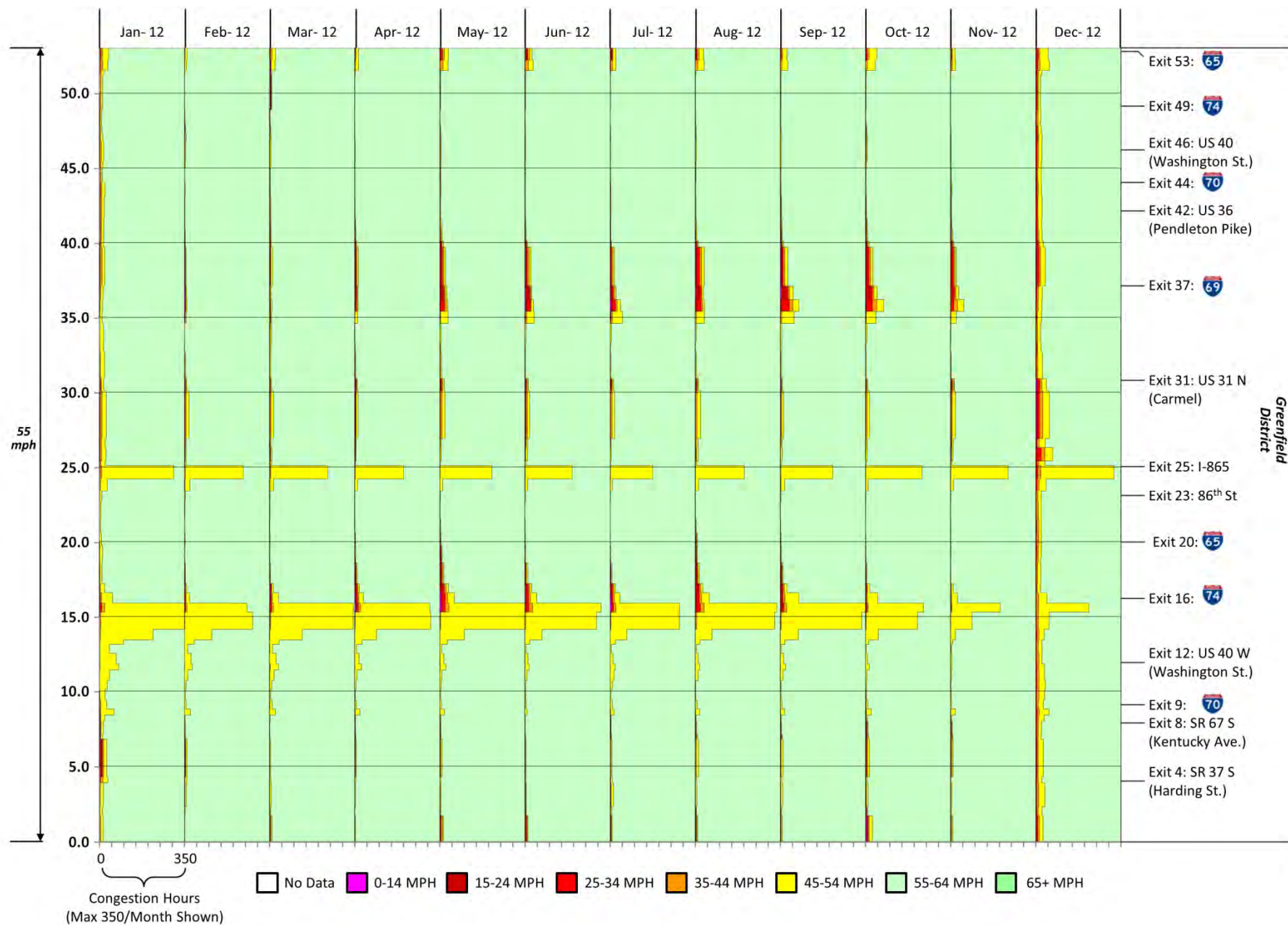


Figure B.24. Inner loop I-465 scaled speed profile, 2012.

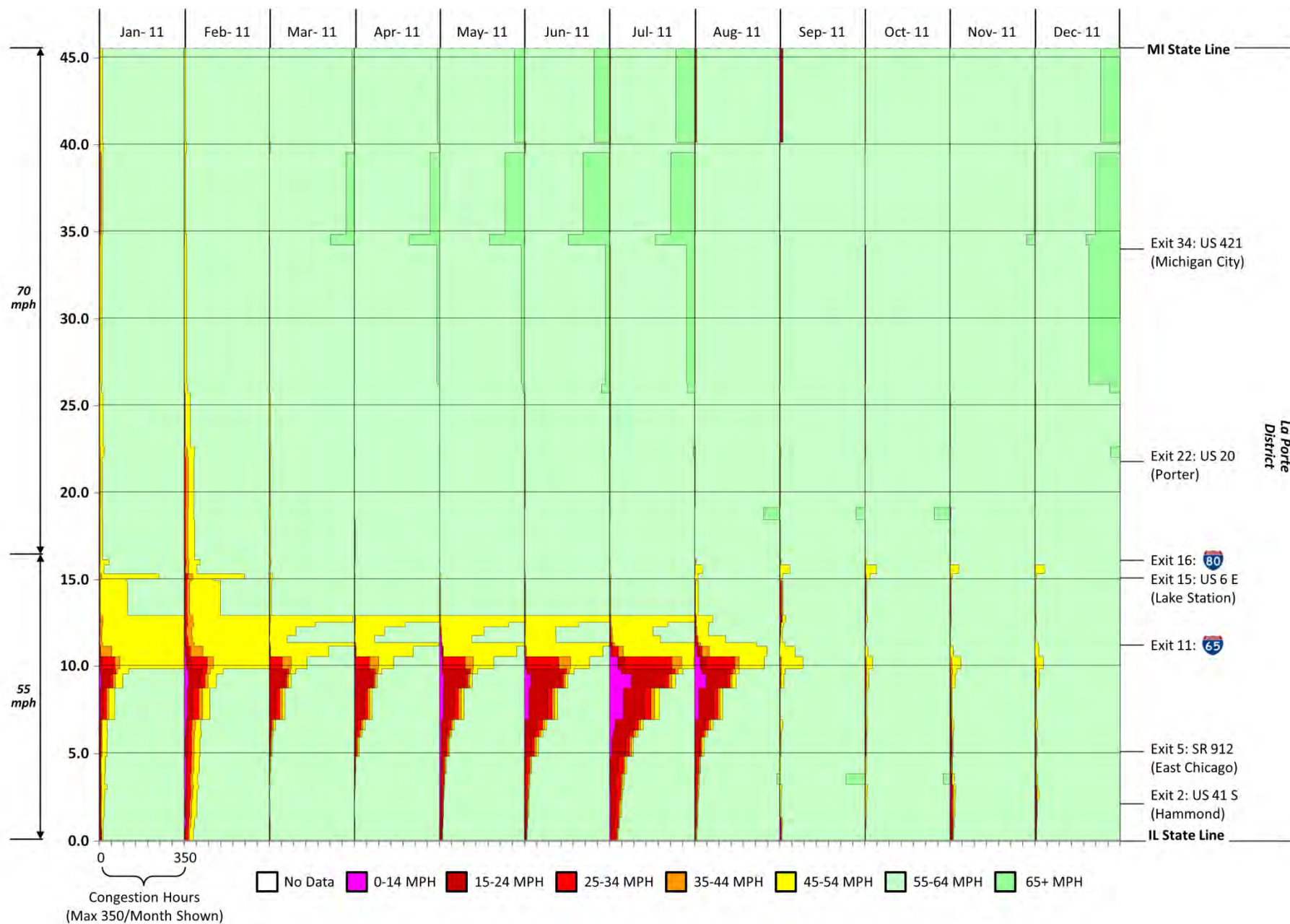


Figure B.25. Eastbound I-94 scaled speed profile, 2011.

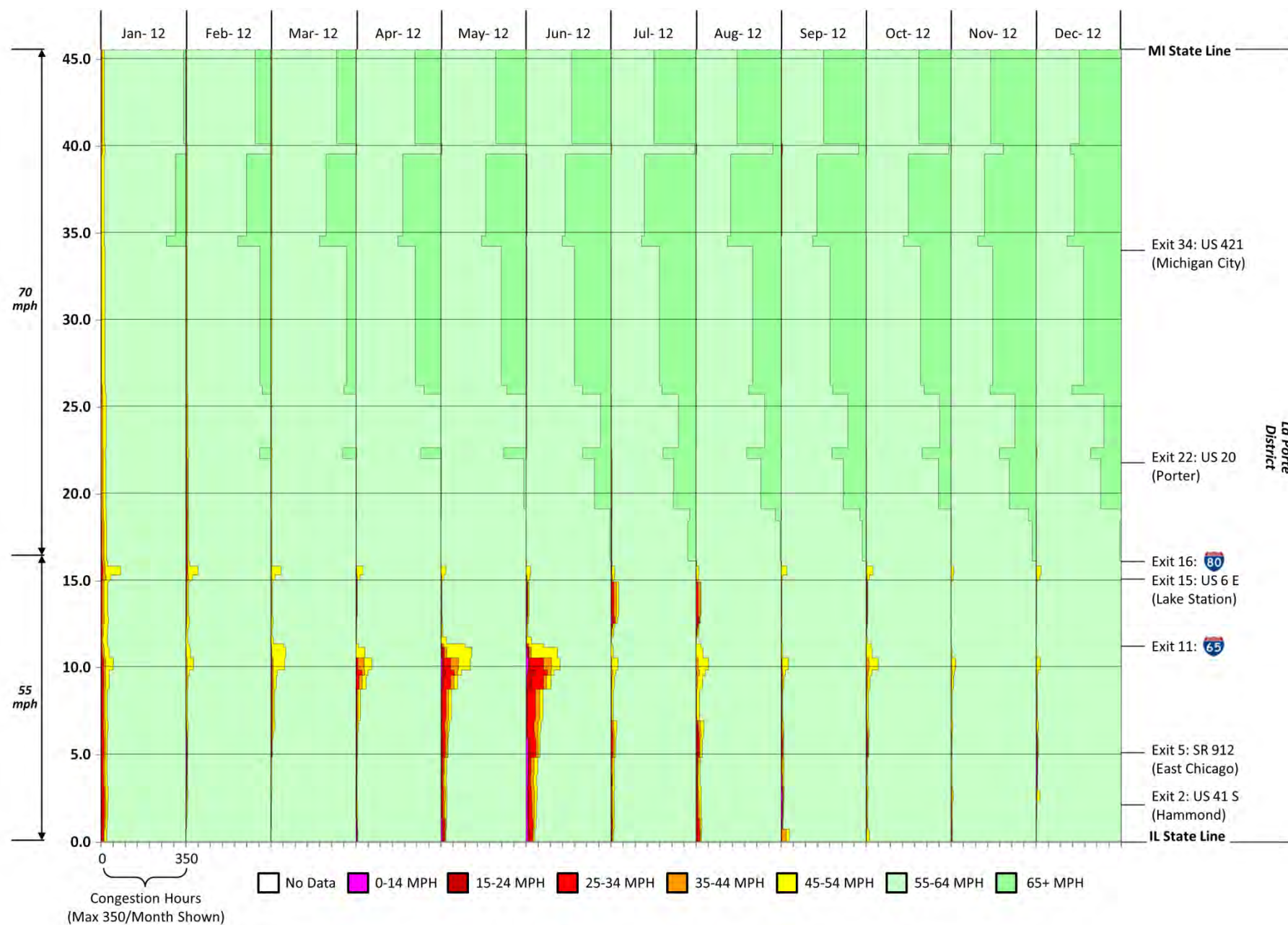


Figure B.26. Eastbound I-94 scaled speed profile, 2012.



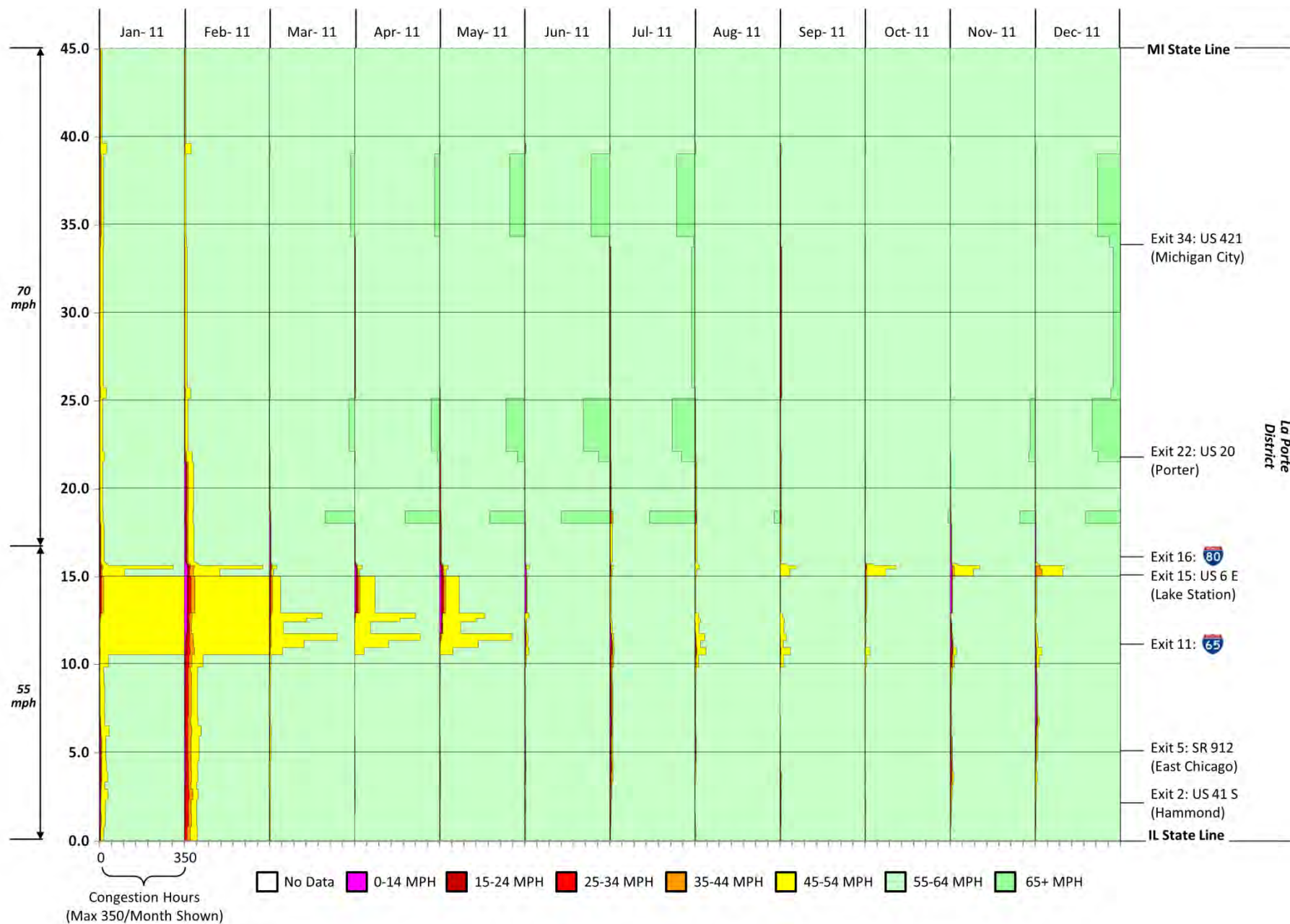


Figure B.27. Westbound I-94 scaled speed profile, 2011.

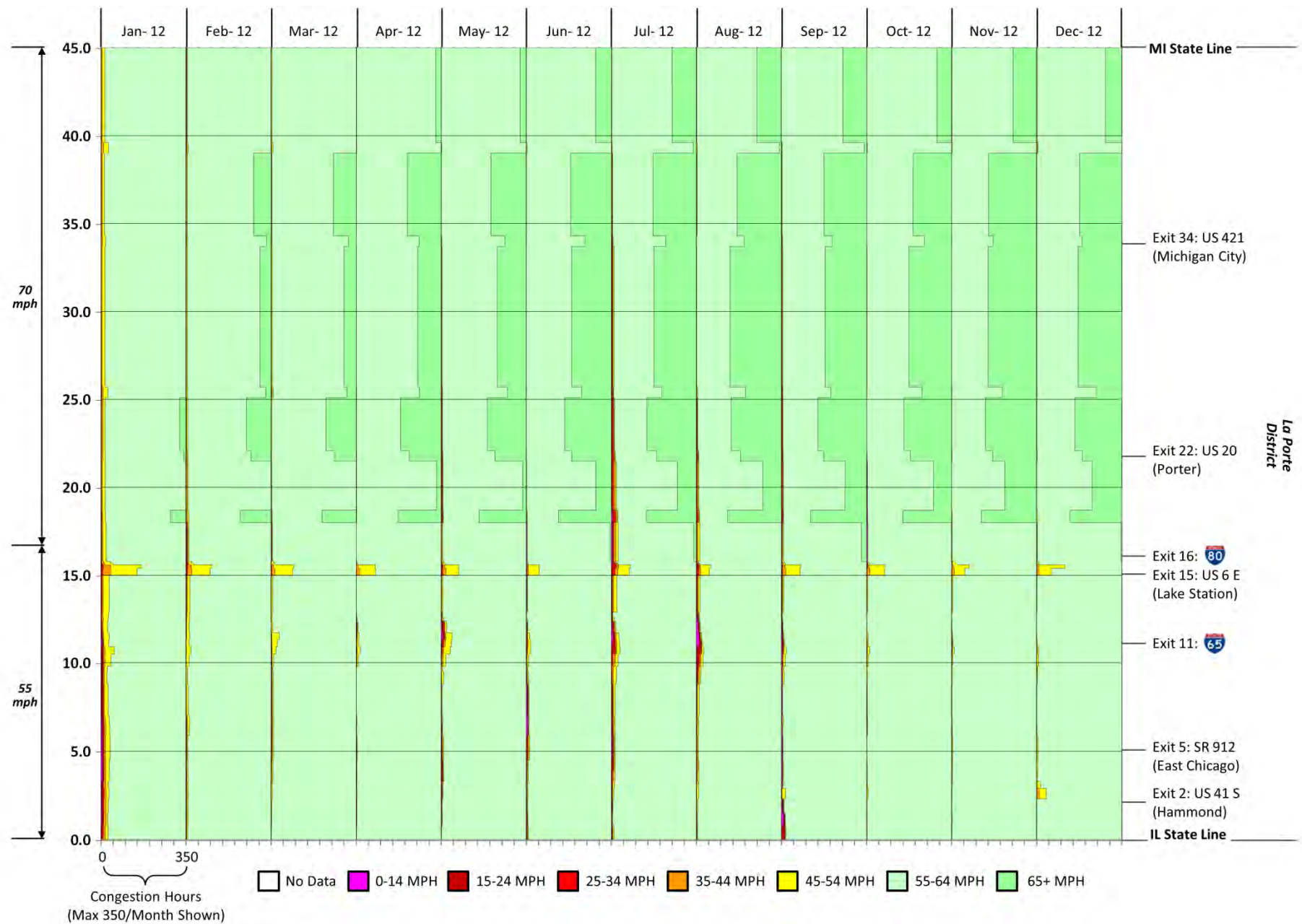
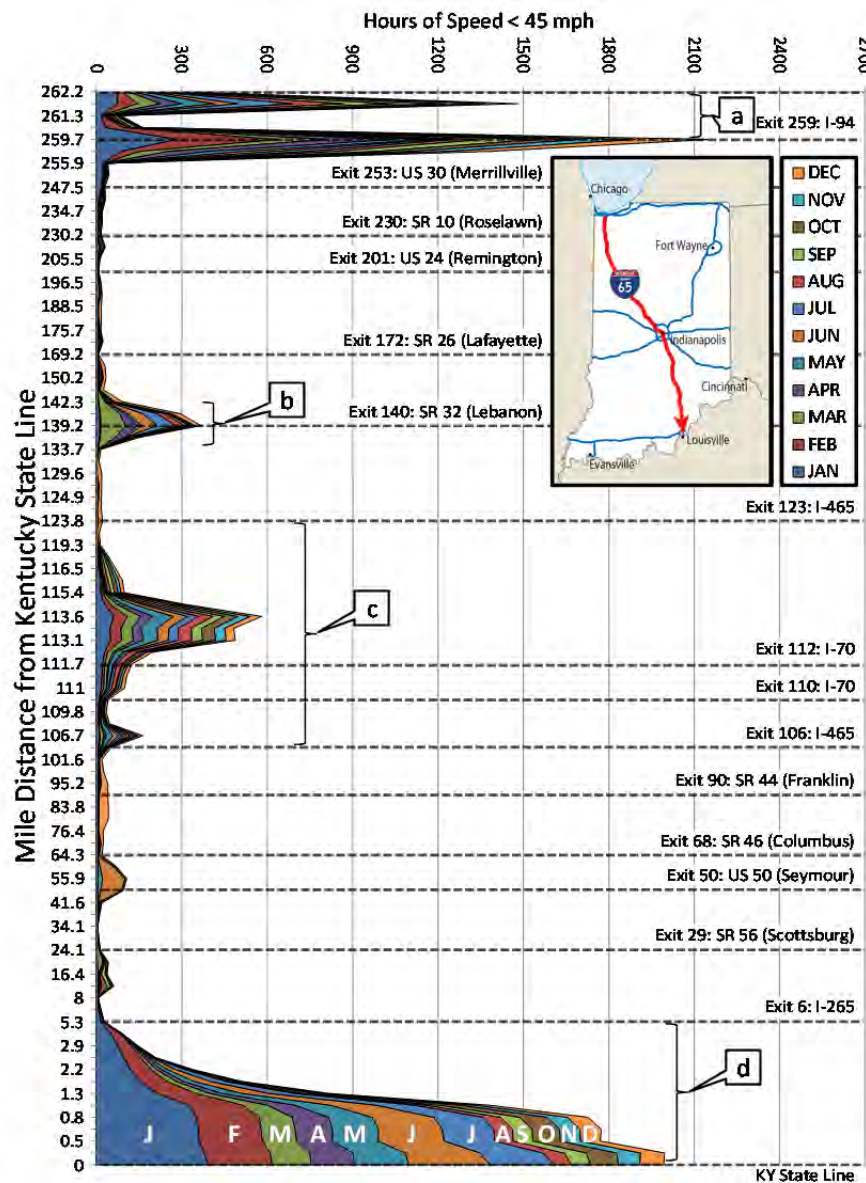


Figure B.28. Westbound I-94 scaled speed profile, 2012.

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# Appendix C: Interstate Congestion Hours Summaries










**Summary:** This performance measure is based on a binary threshold of 45 miles per hour (mph) to characterize whether a road section was congested for a particular month. The congestion hour performance measure works well for a preliminary evaluation of a series of segments to identify locations of traffic congestion. This measure was developed in the *2011 Indiana Interstate Mobility Report* and is included in this report for consistency. The performance measure does not convey the severity of the congestion. This is because the binary 45 mph average threshold gives the same weighting to a segment that is operating at 44 mph as a segment that is operating at 10 mph.

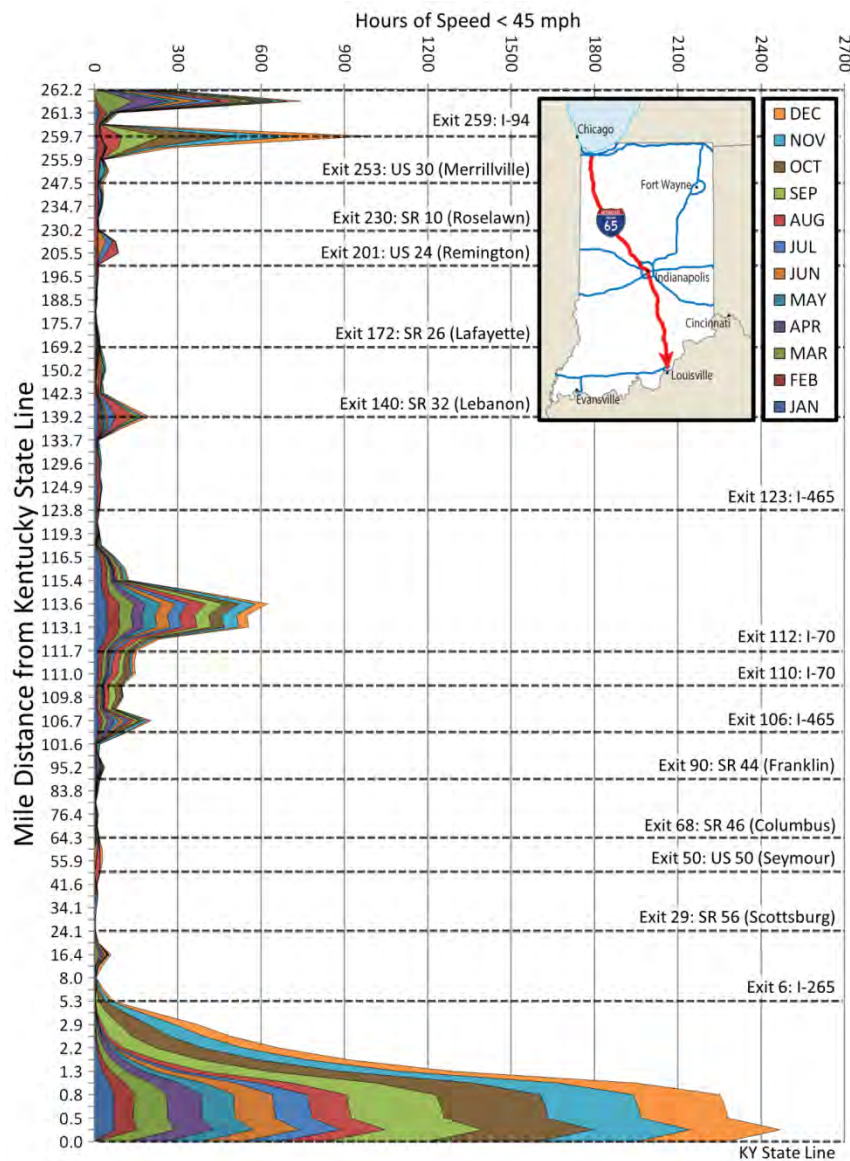
- a. Gary area
- b. Lebanon area
- c. Indianapolis area
- d. Louisville area

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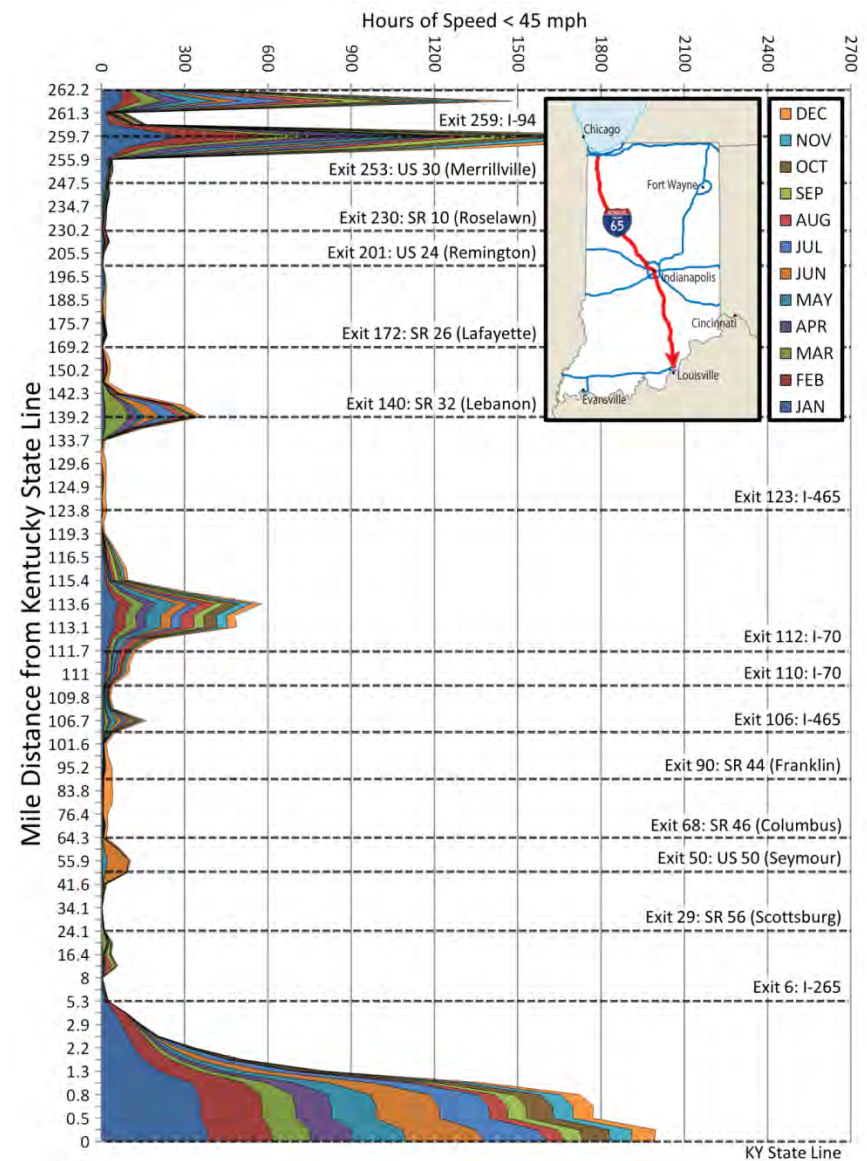
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	Indiana Interstate 69	116, 130
	Indiana Interstate 64	118, 132
	Indiana Interstate 465	120, 134
	Indiana Interstate 94	122, 136



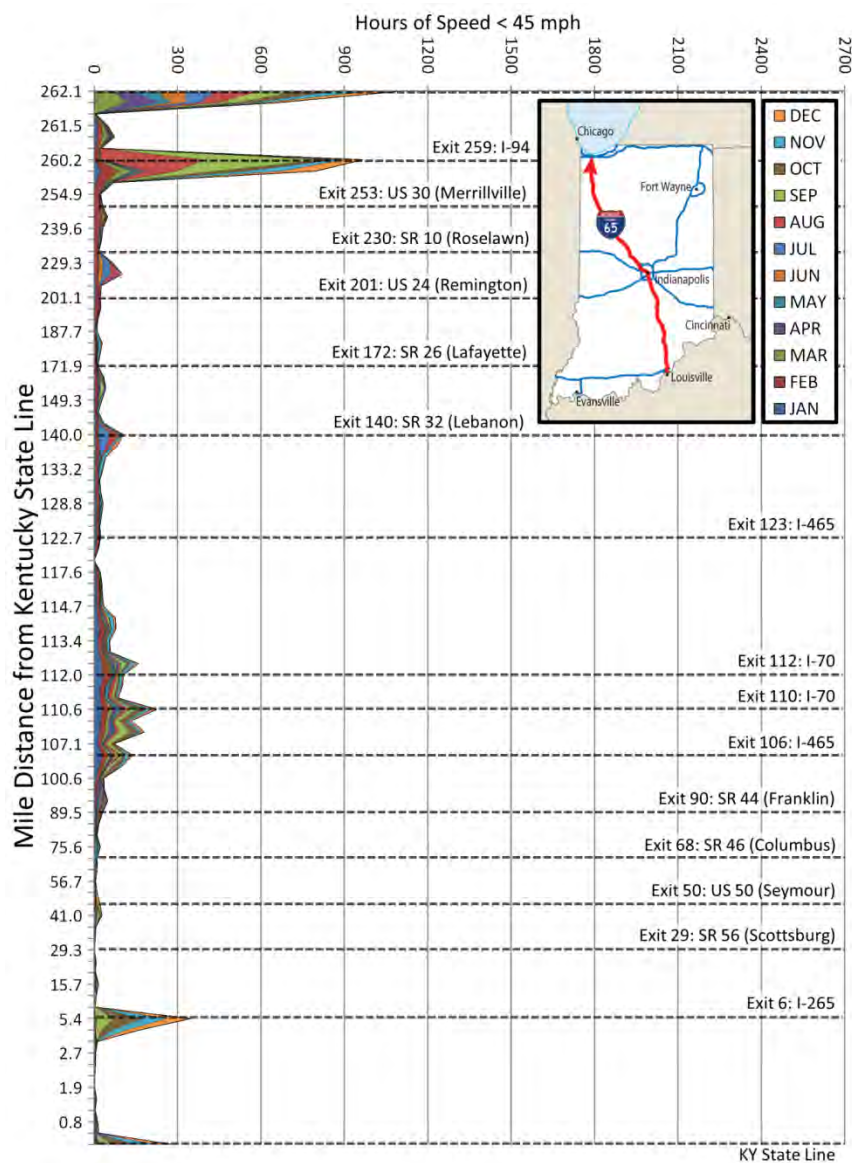


(a) 2011

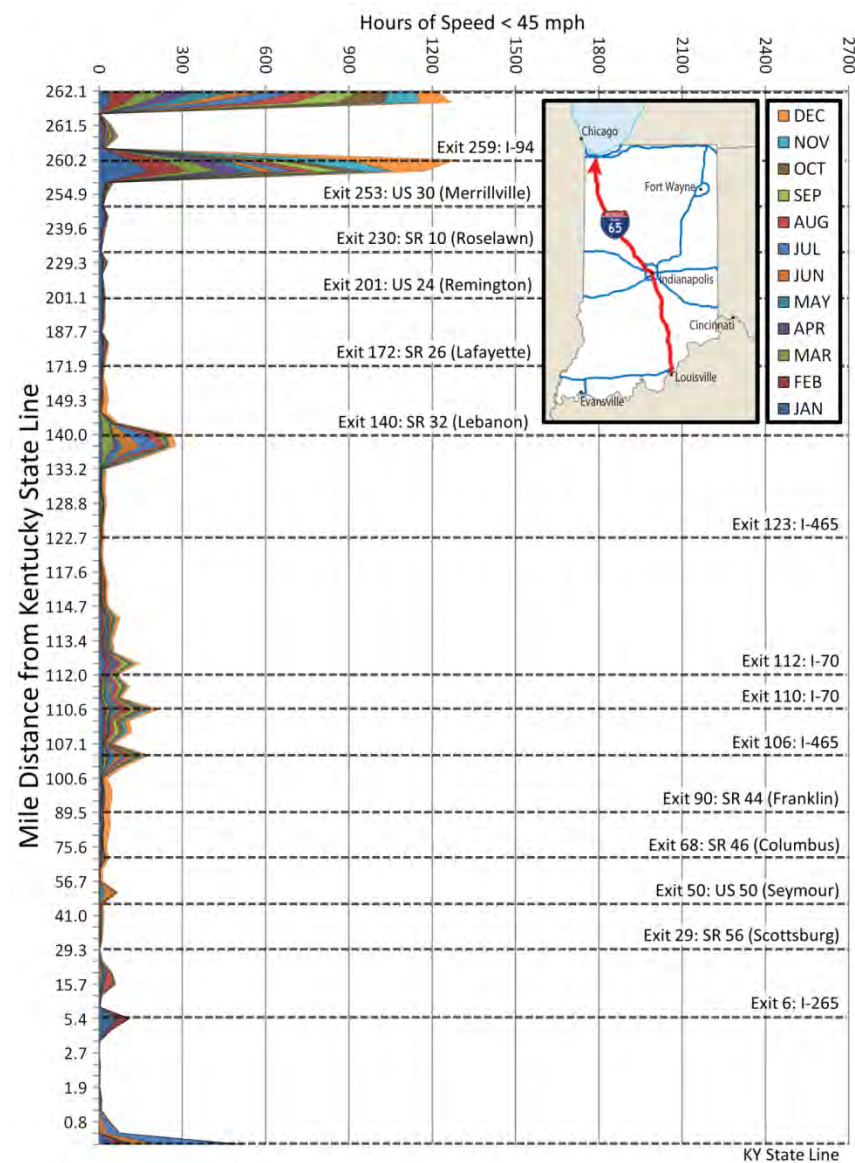


(b) 2012

Figure C.1. Congestion hours by month, southbound I-65.



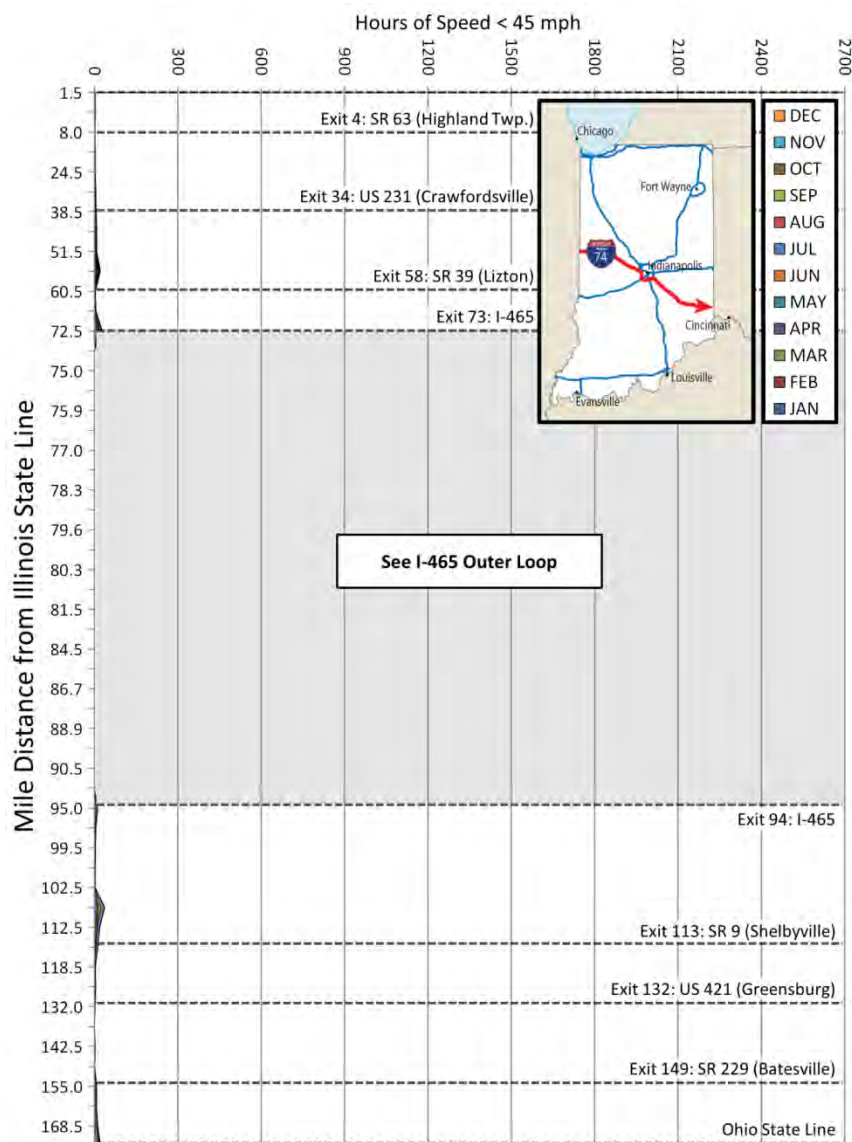
(a) 2011



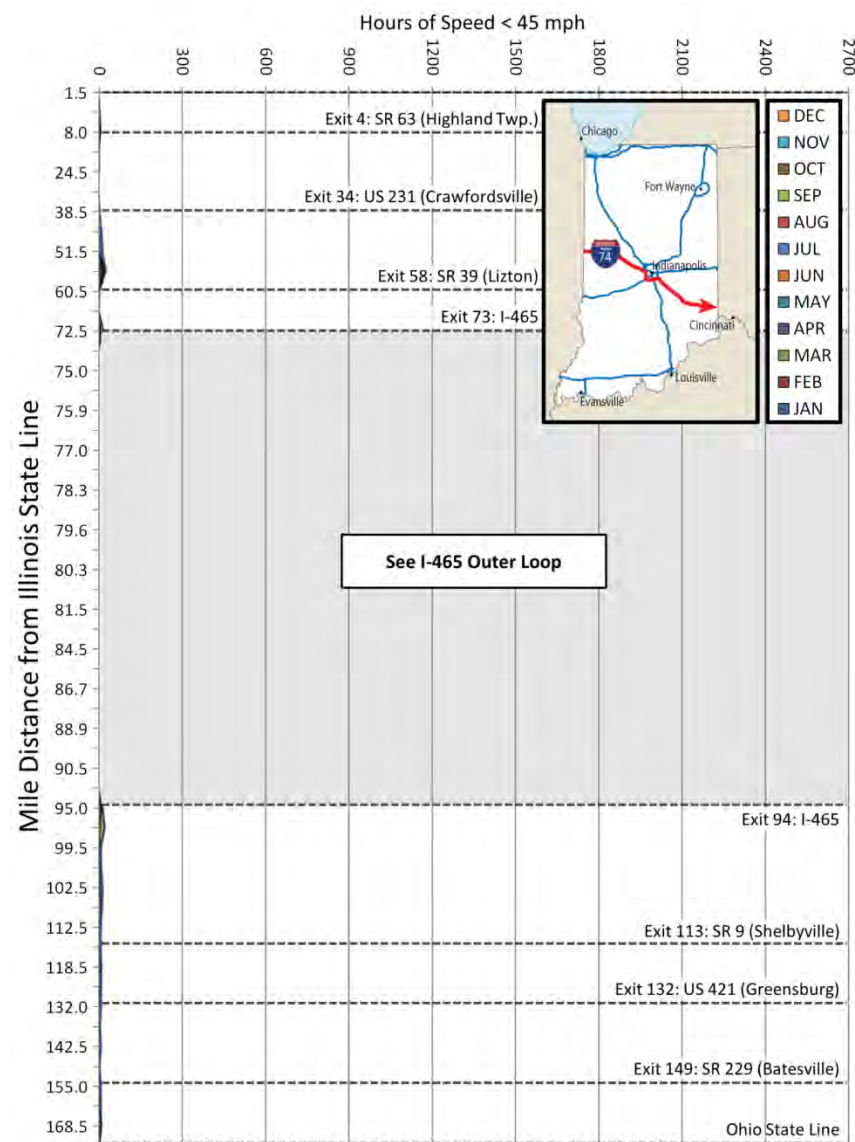
(b) 2012

Figure C.2. Congestion hours by month, northbound I-65.





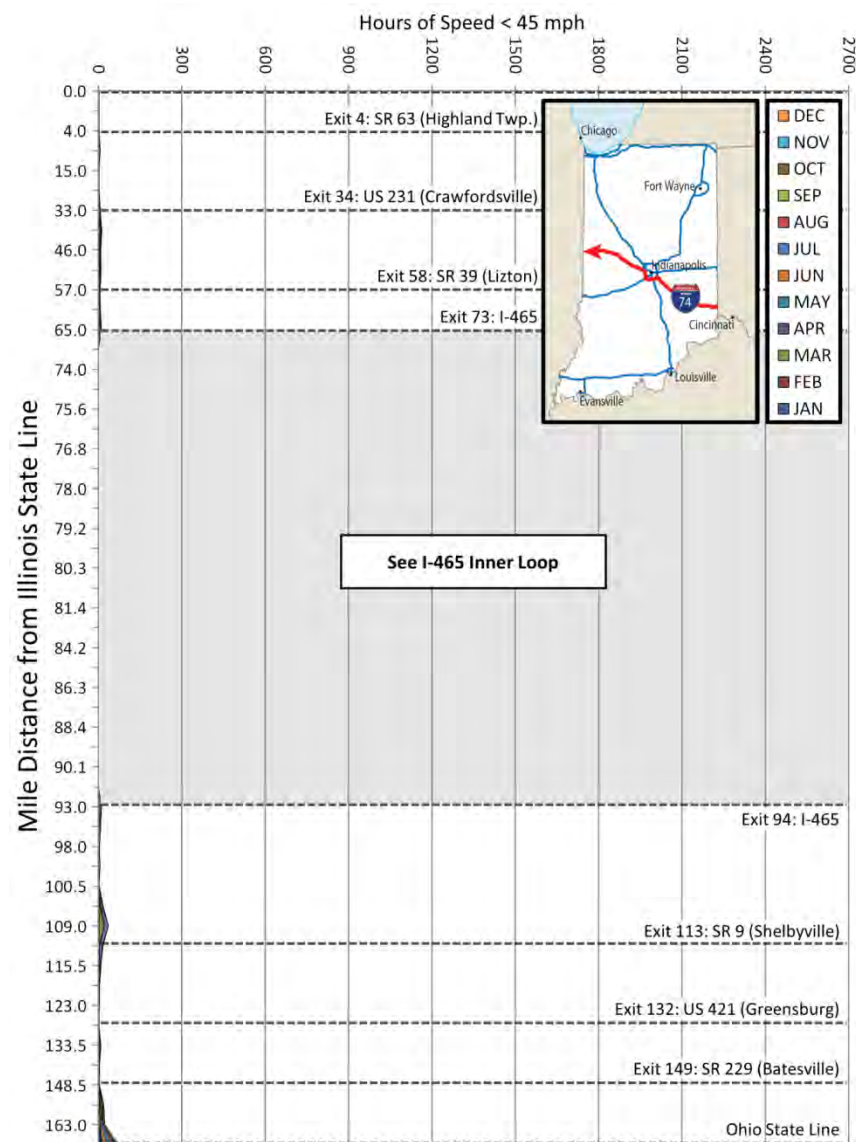
(a) 2011



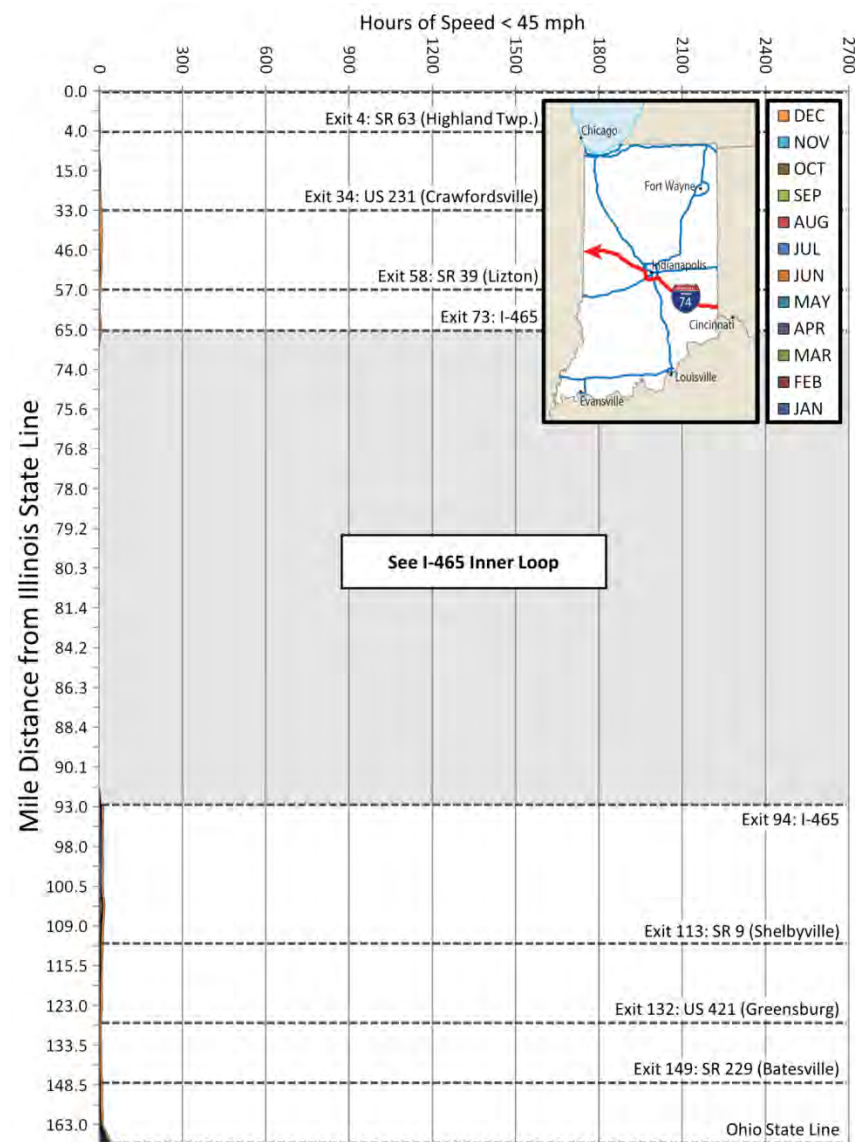
(b) 2012

Figure C.3. Congestion hours by month, eastbound I-74.



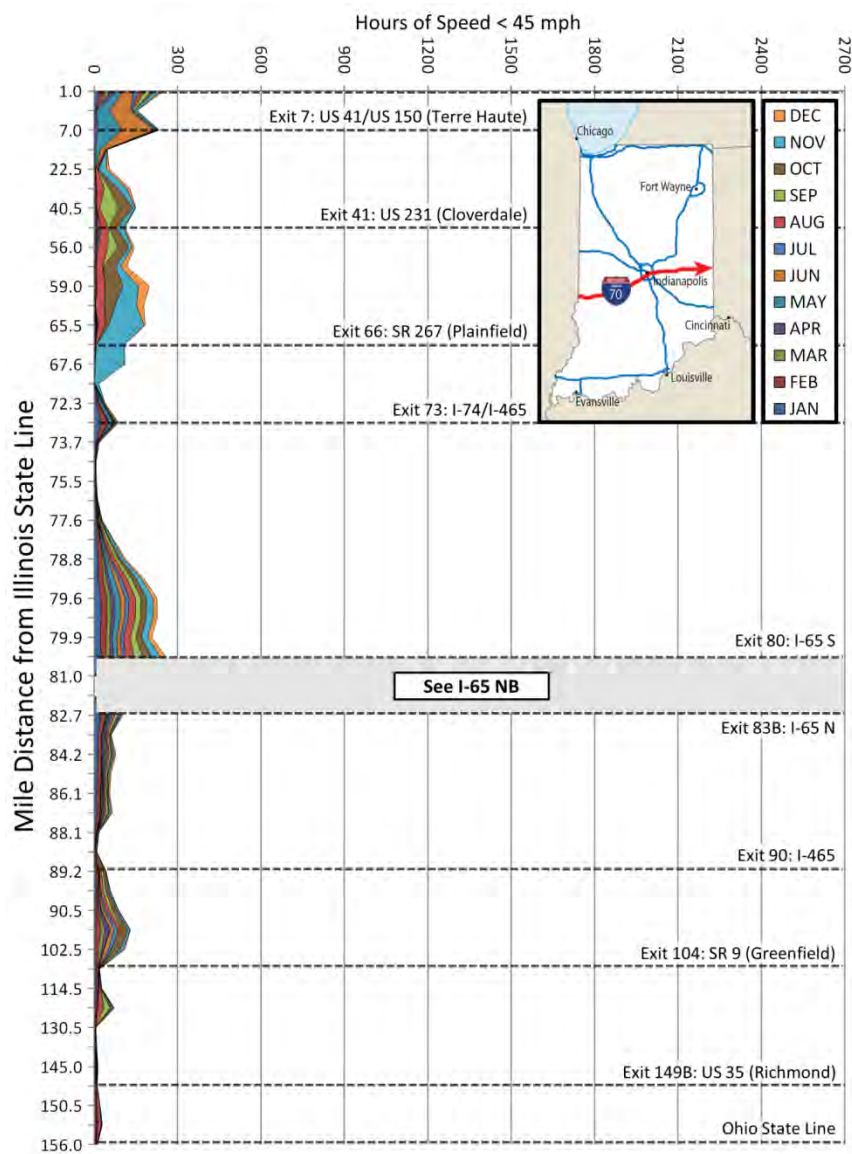


(a) 2011

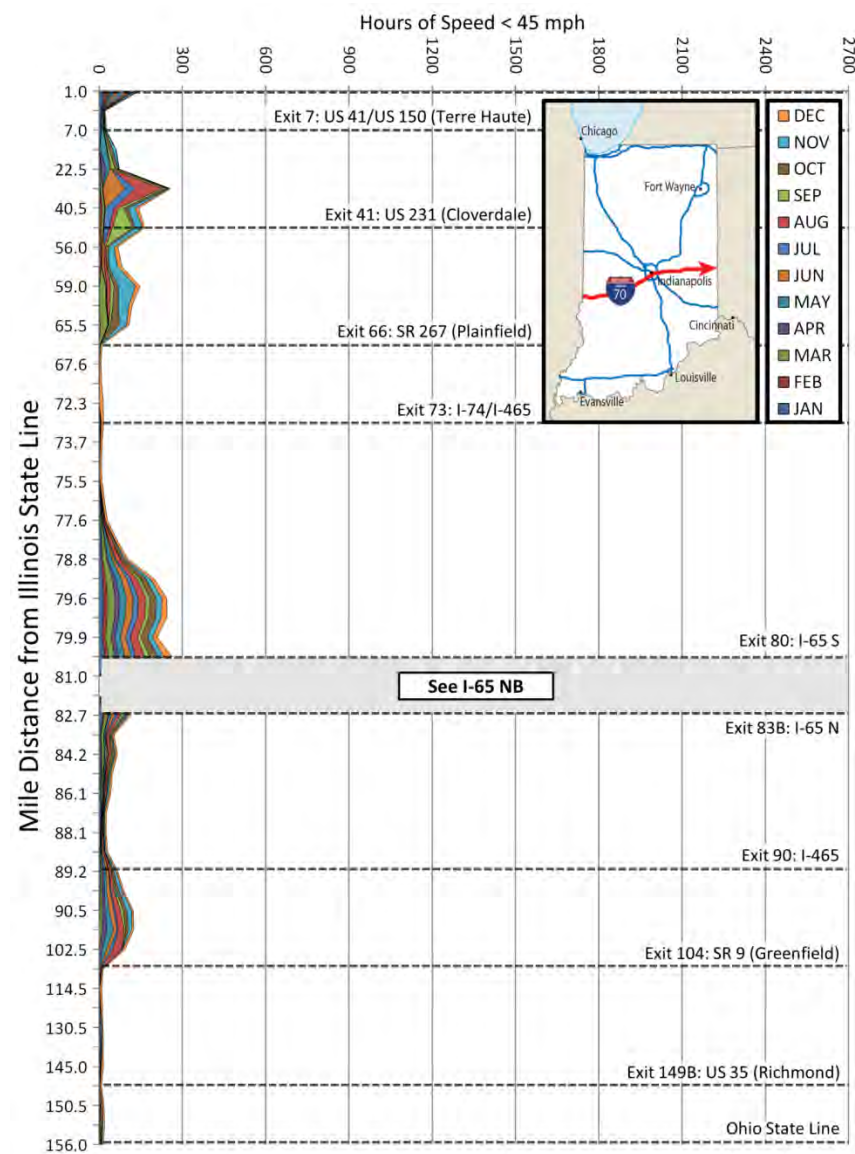


(b) 2012

Figure C.4. Congestion hours by month, westbound I-74.

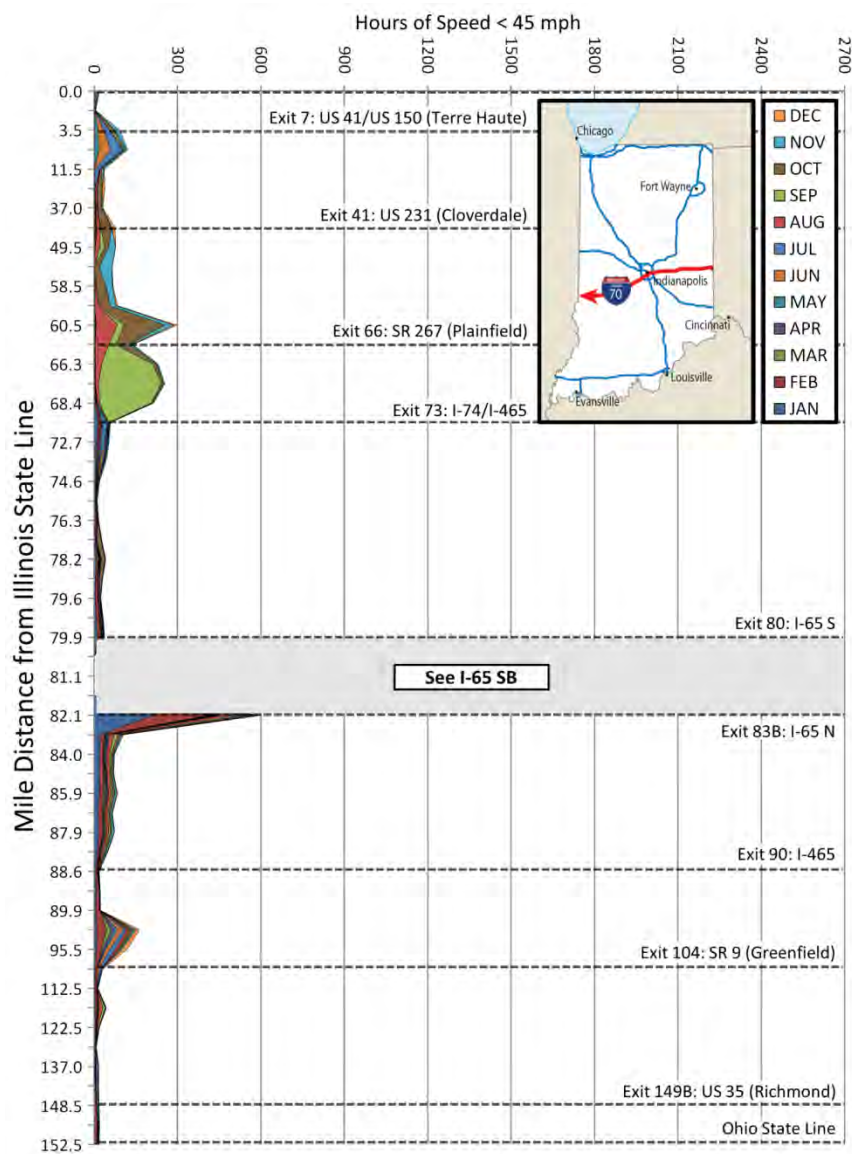


(a) 2011

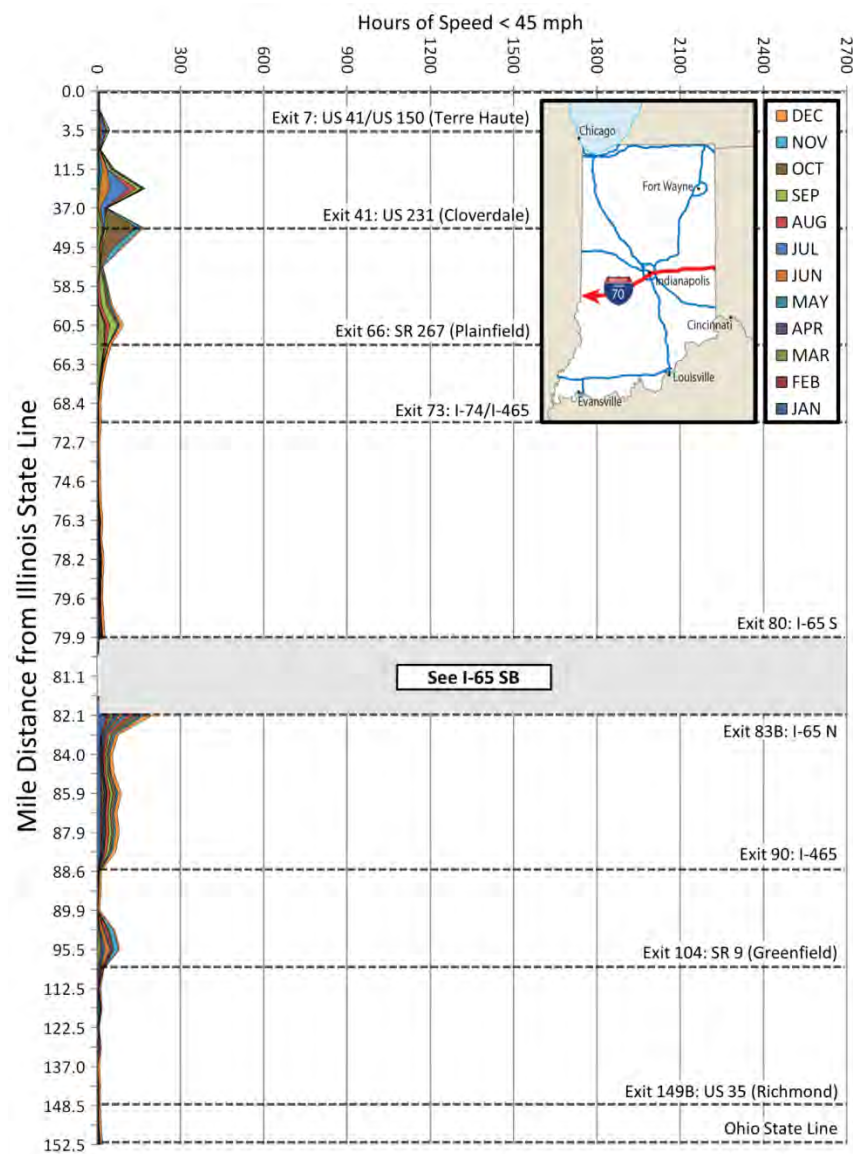


(b) 2012

Figure C.5. Congestion hours by month, eastbound I-70.



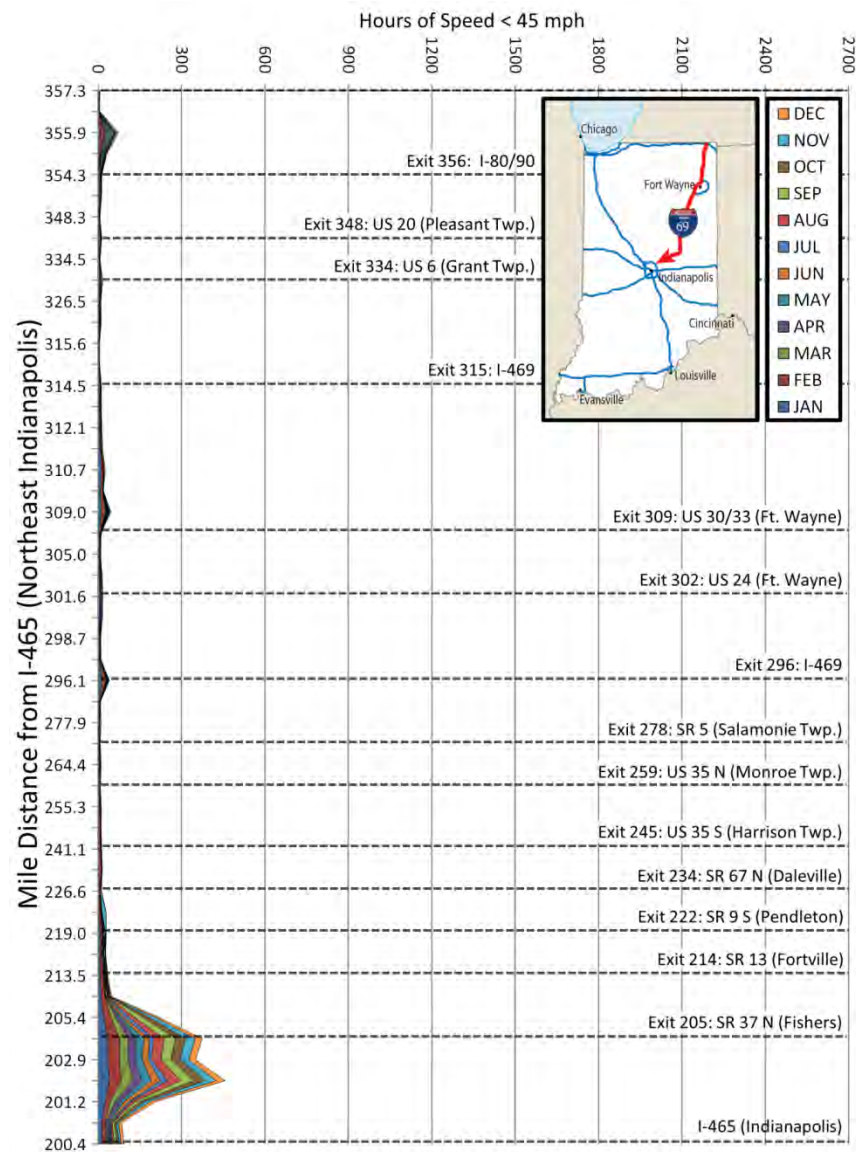
(a) 2011



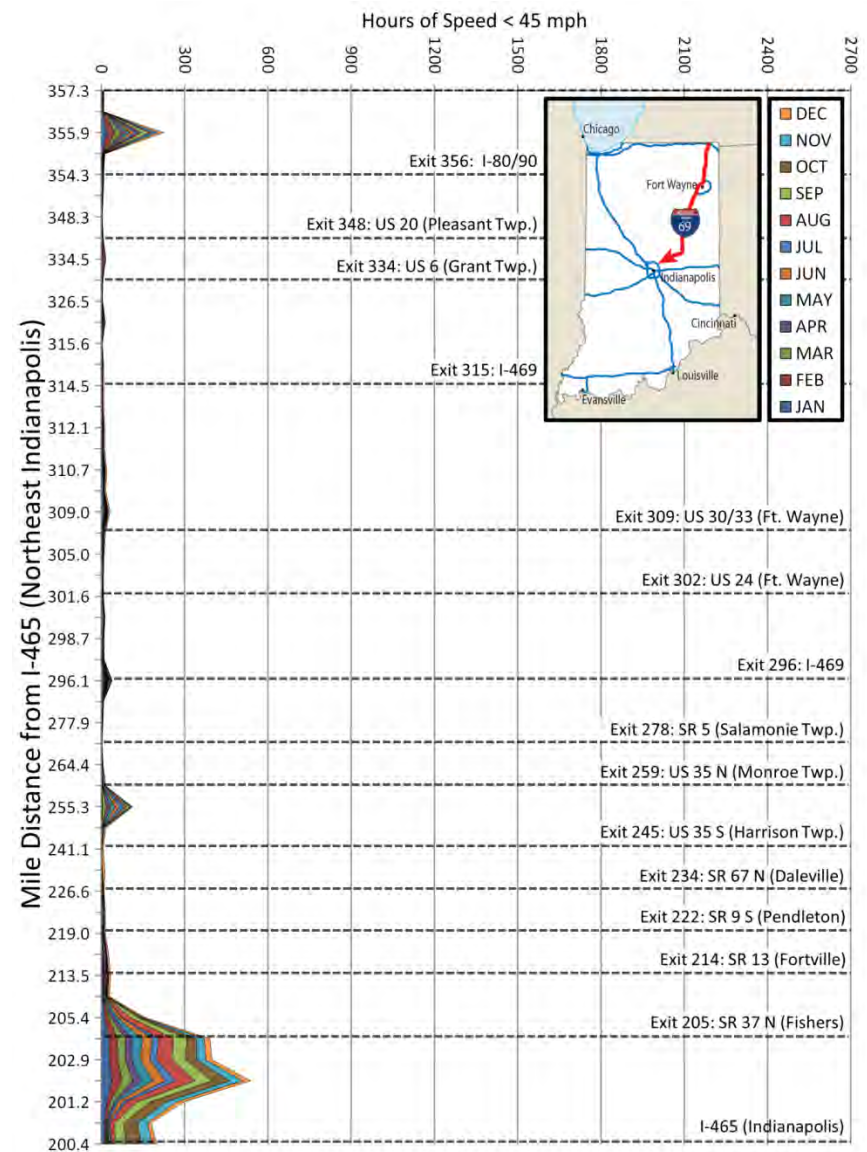
(b) 2012

Figure C.6. Congestion hours by month, westbound I-70.



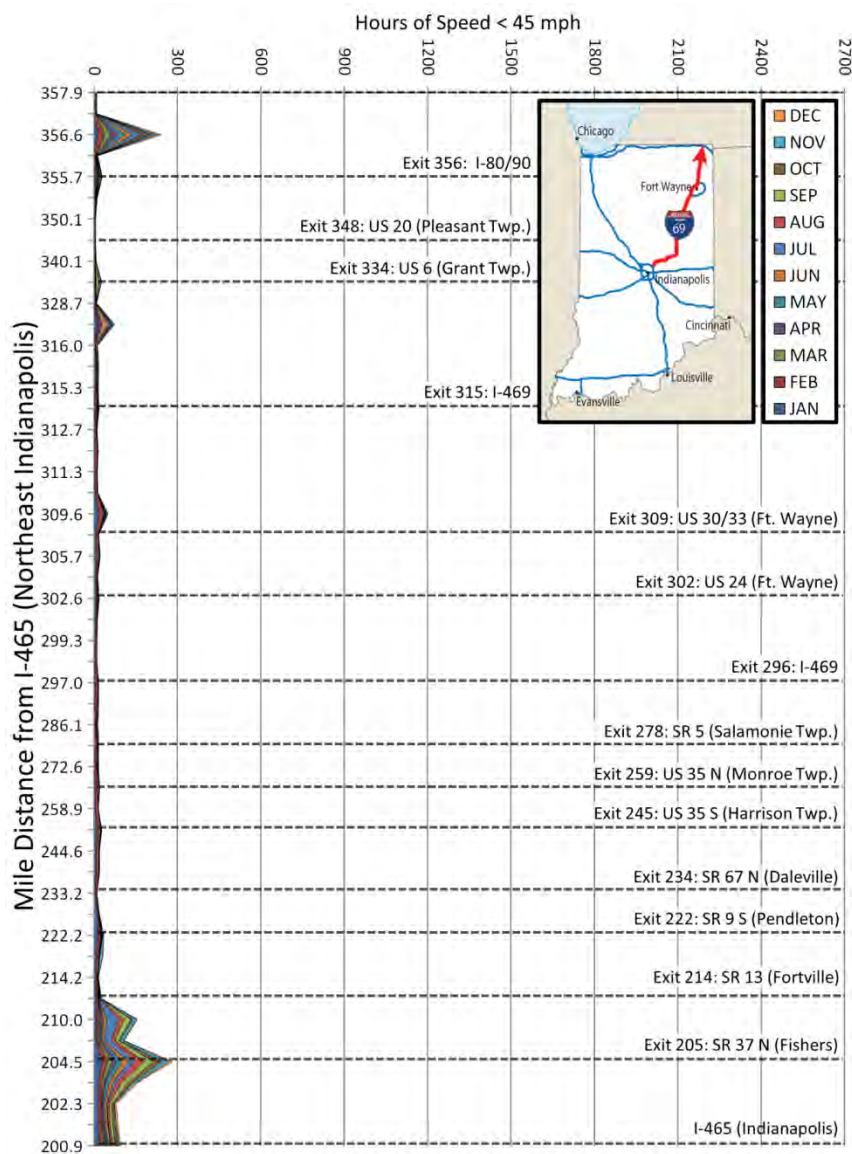


(a) 2011

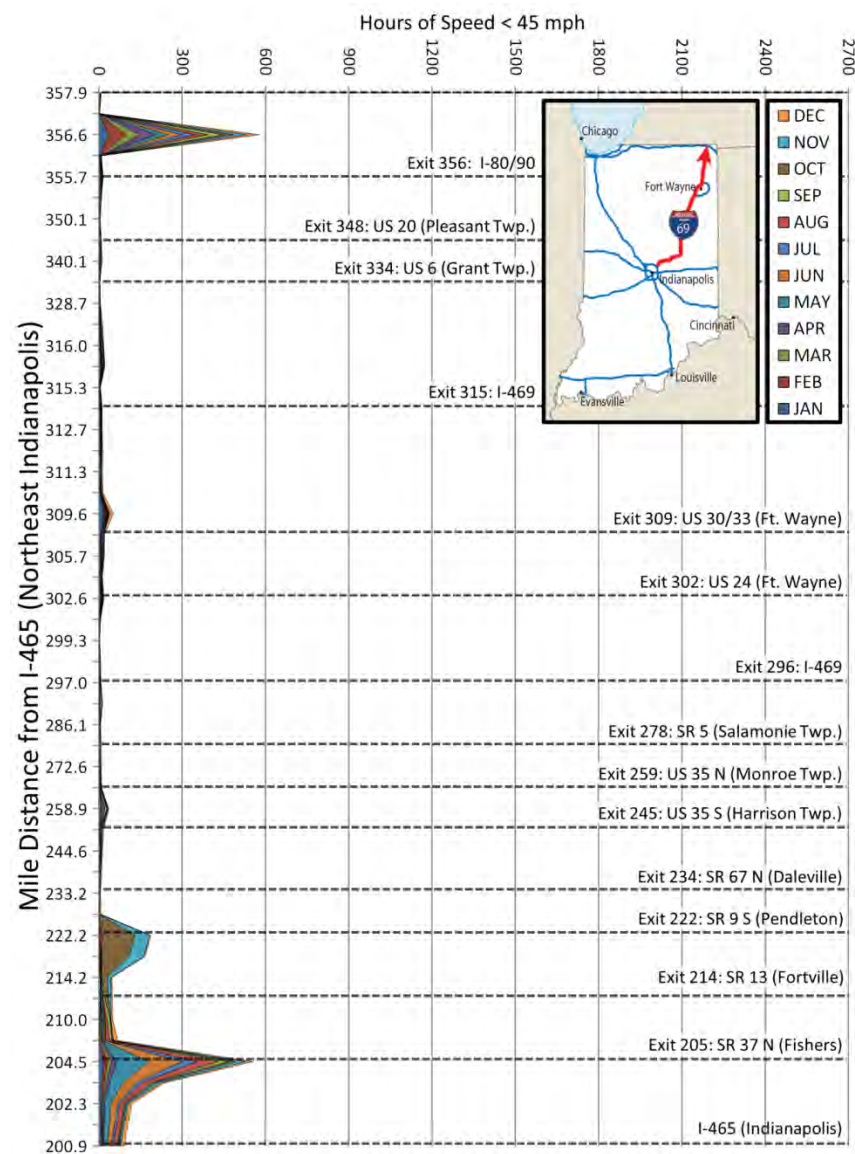


(b) 2012

Figure C.7. Congestion hours by month, southbound I-69.



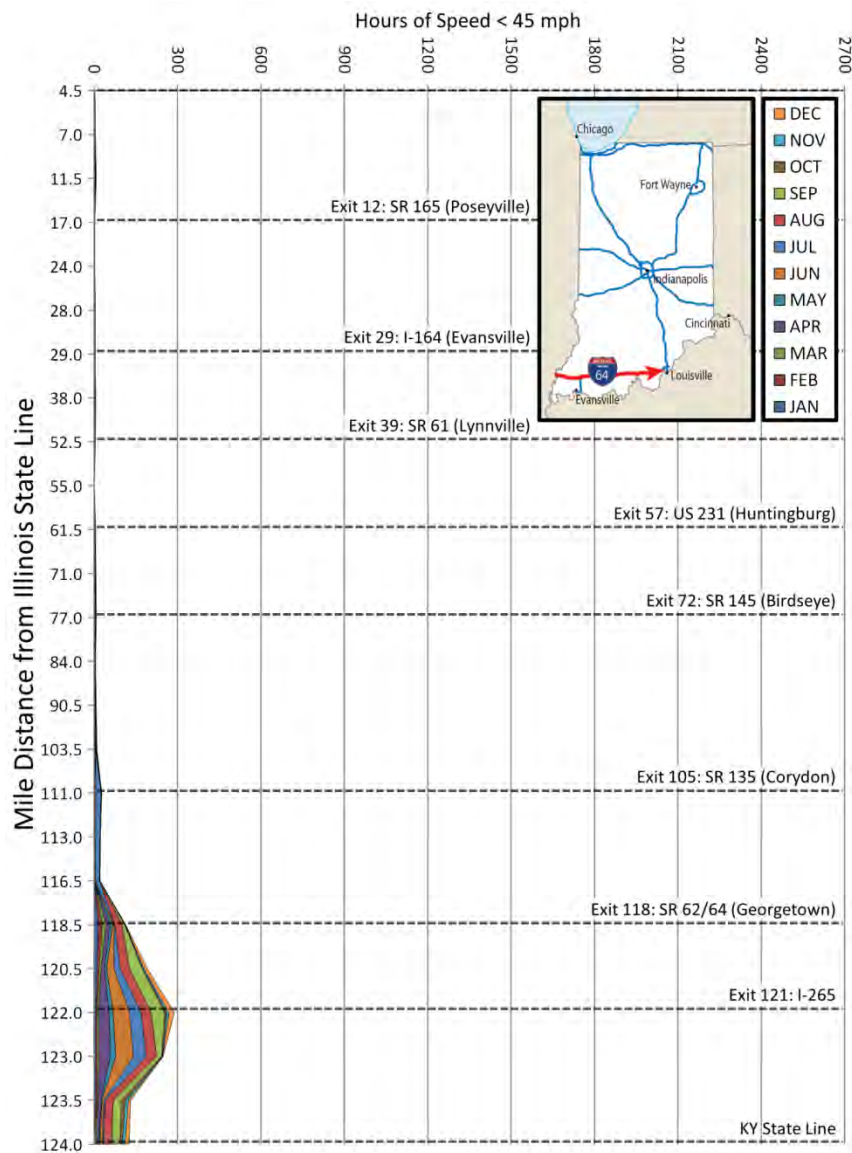
(a) 2011



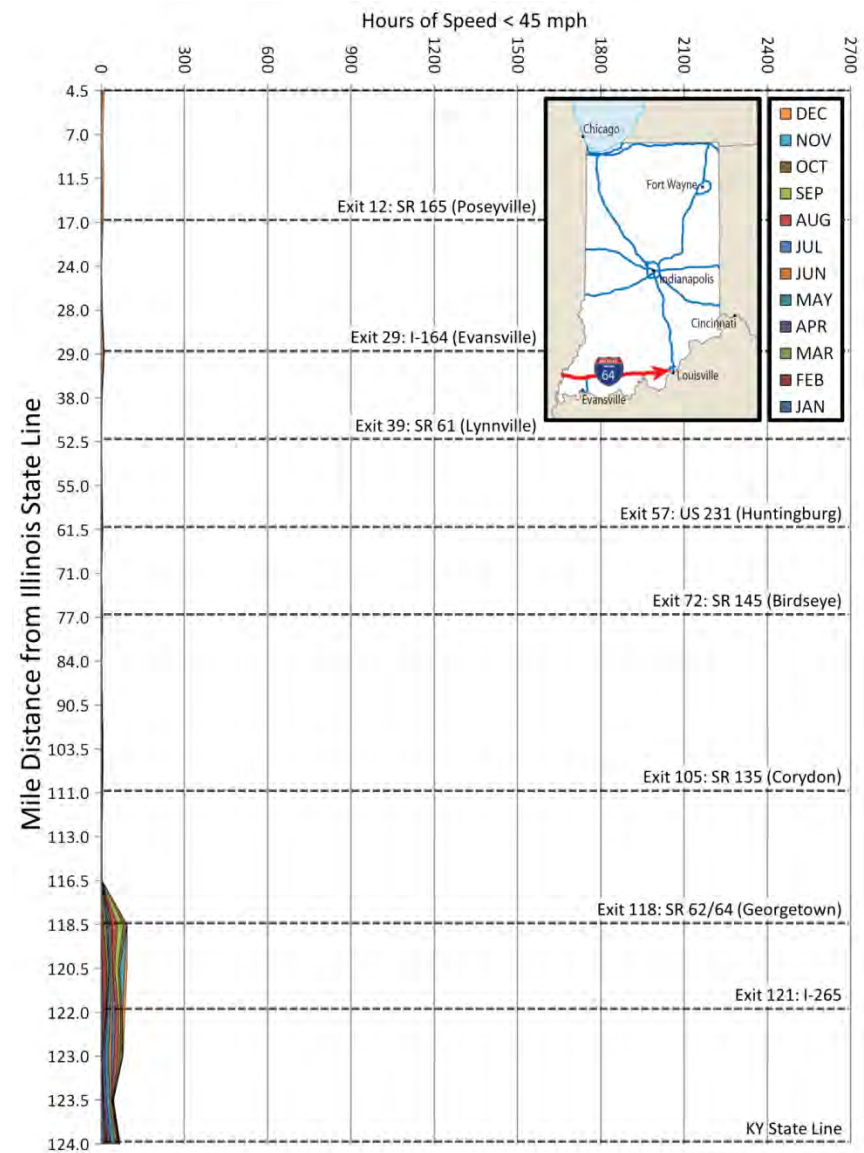
(b) 2012

Figure C.8. Congestion hours by month, northbound I-69.





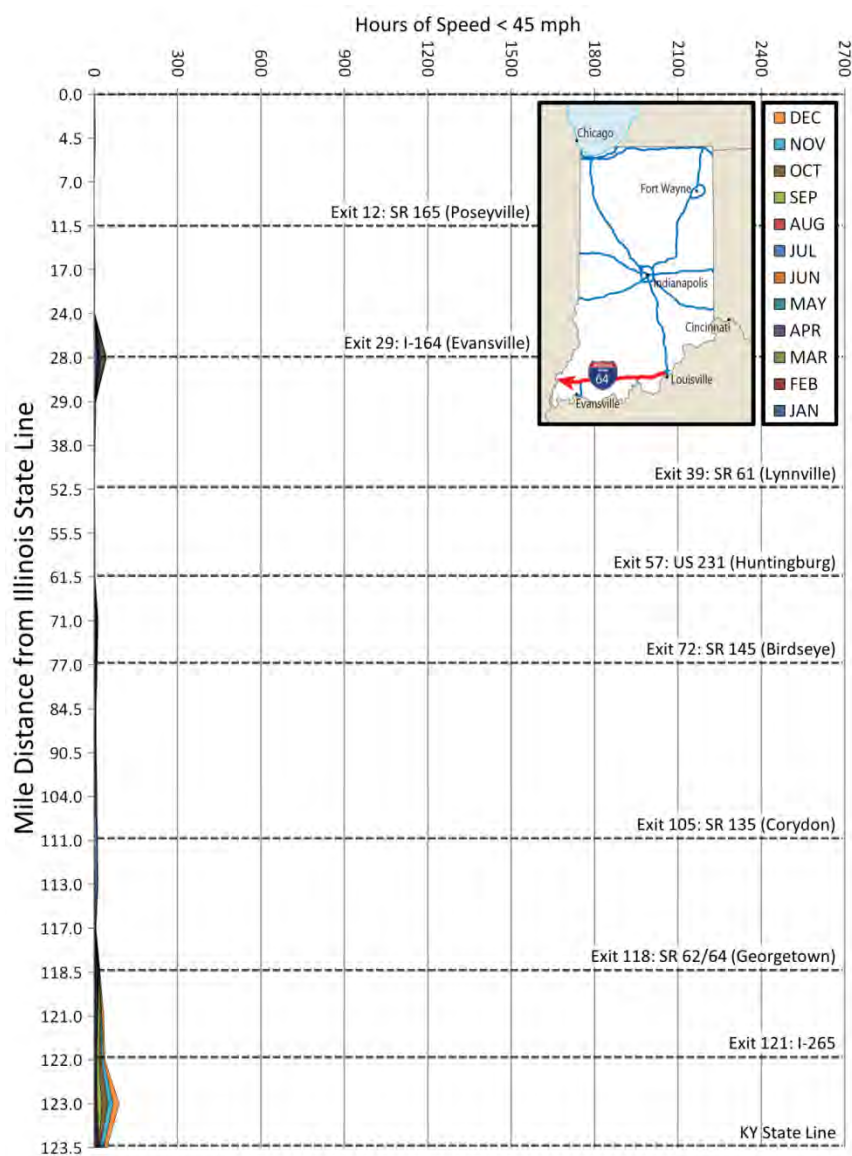
(a) 2011



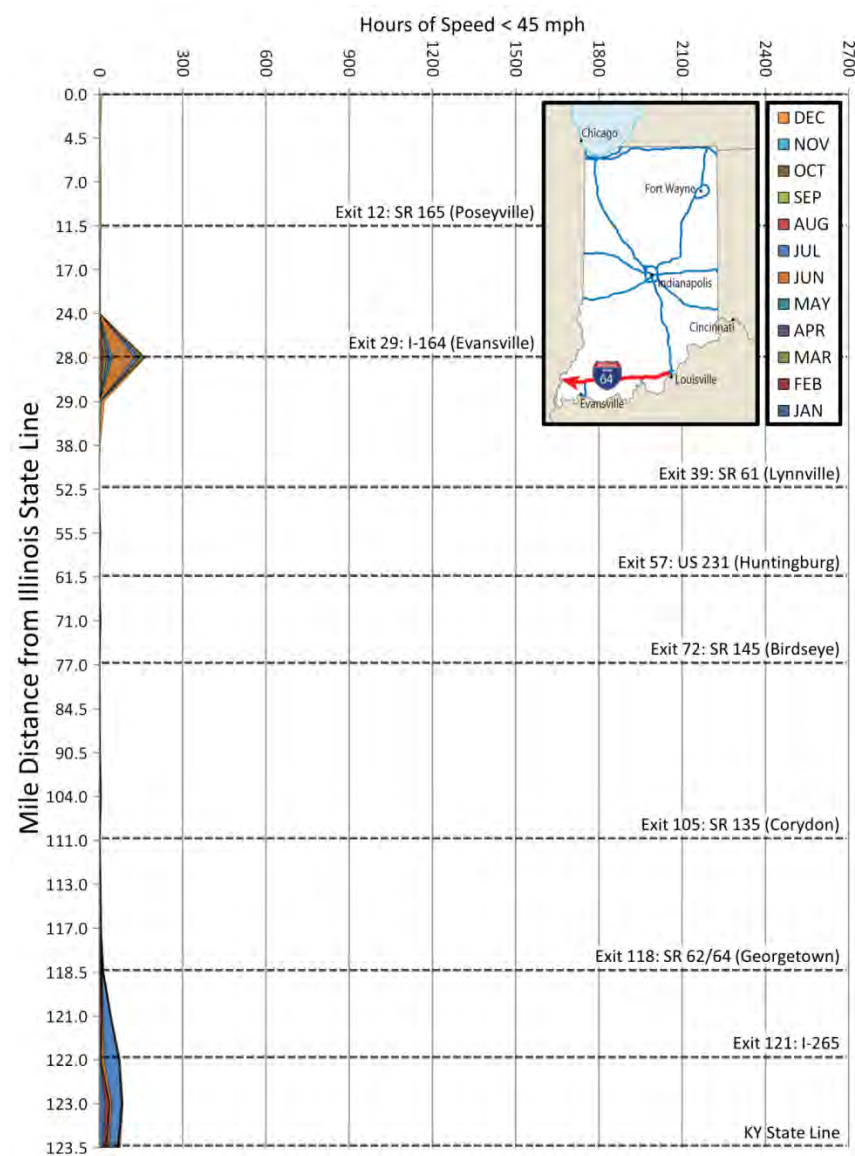
(b) 2012

Figure C.9. Congestion hours by month, eastbound I-64.



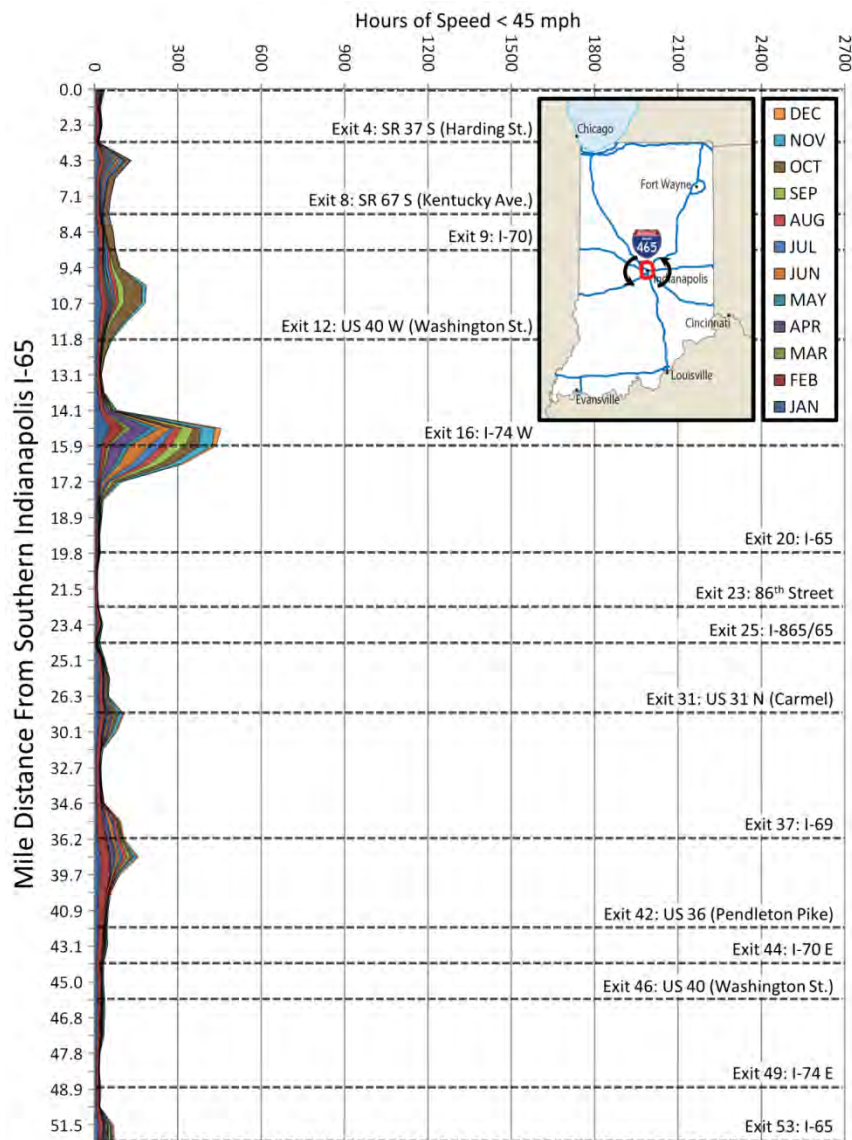


(a) 2011

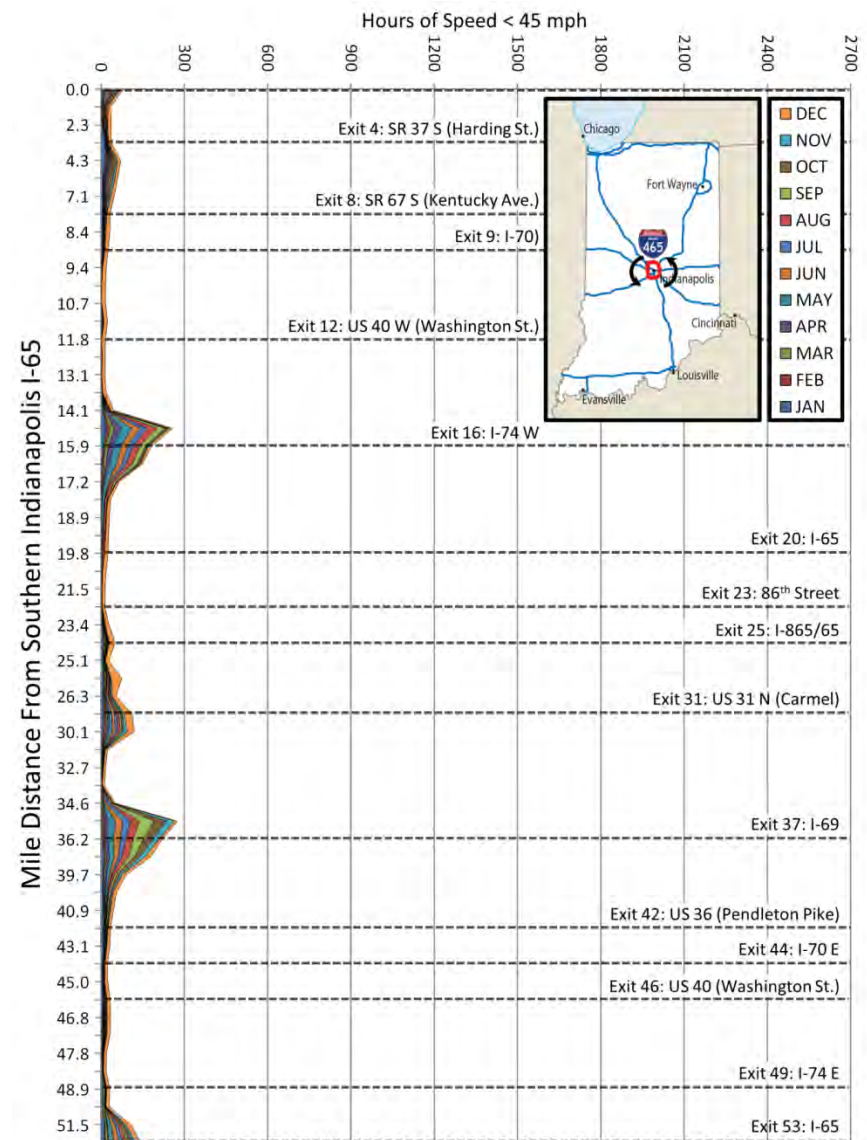


(b) 2012

Figure C.10 Congestion hours by month. westbound I-64.



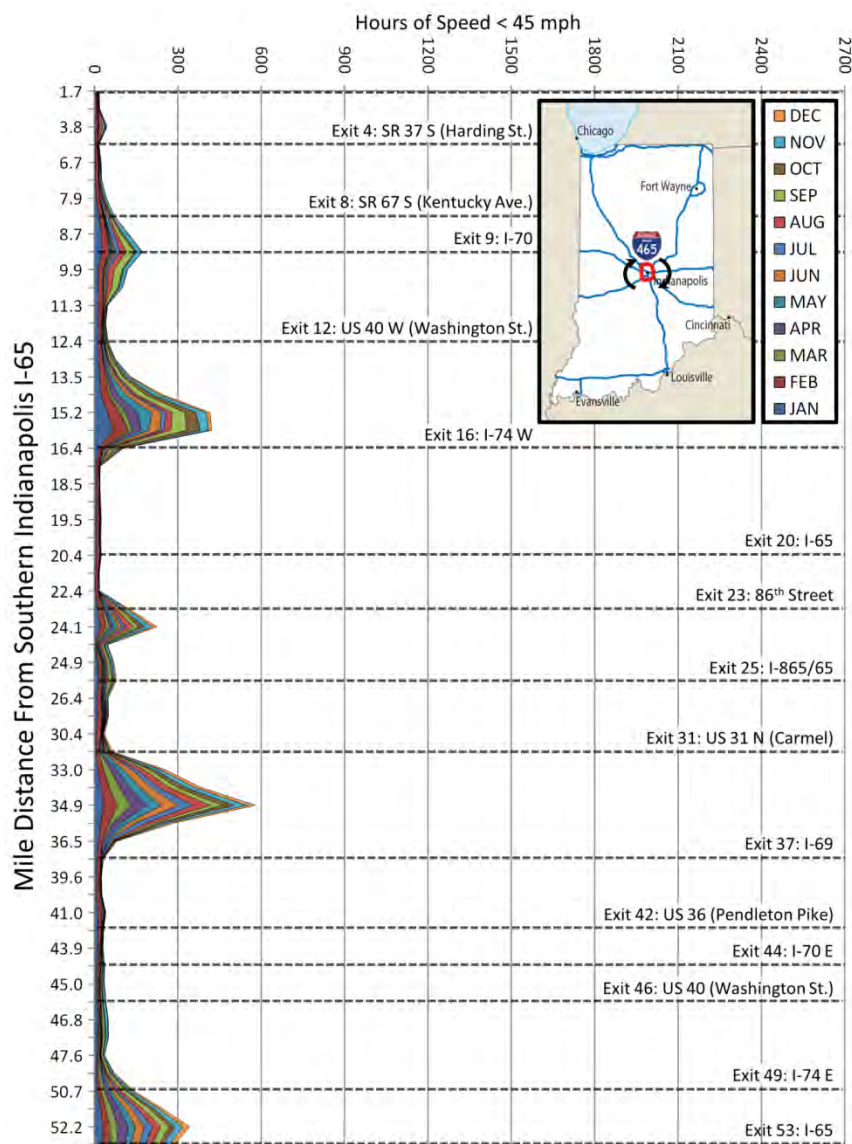
(a) 2011



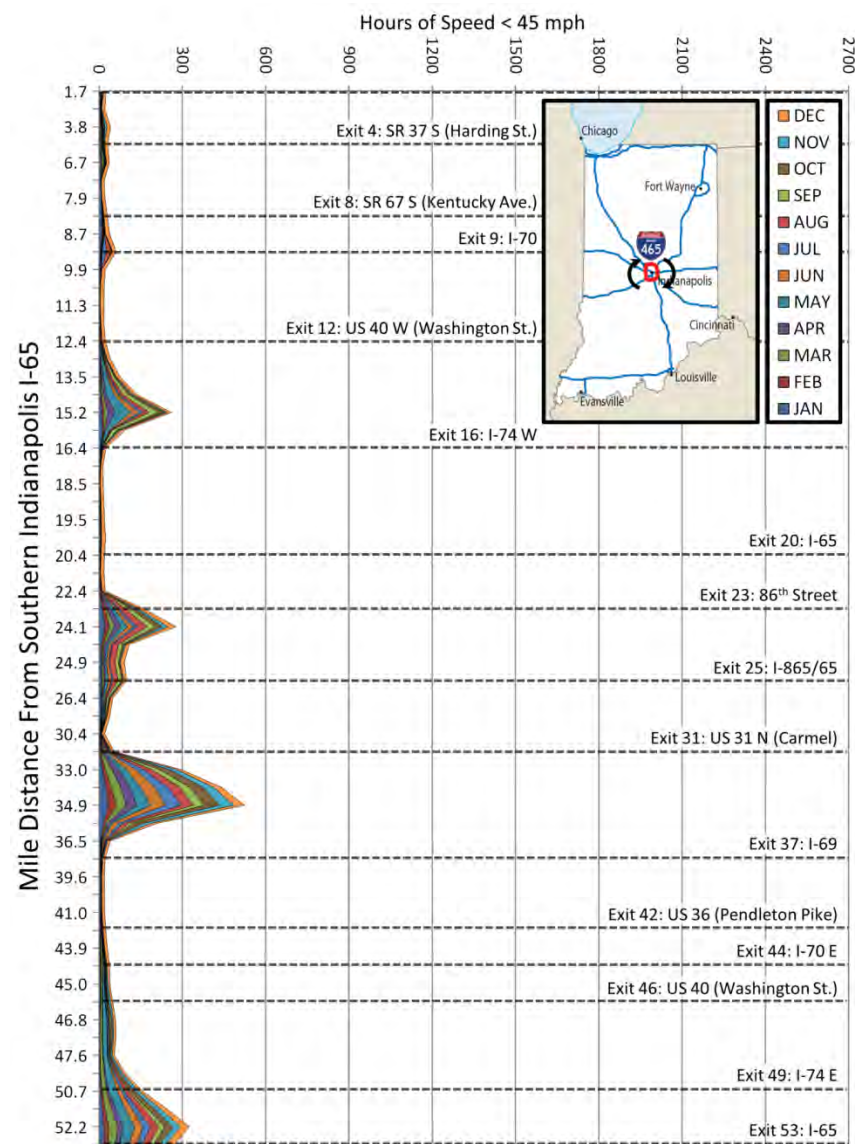
(b) 2012

Figure C.11. Congestion hours by month, outer loop I-465.





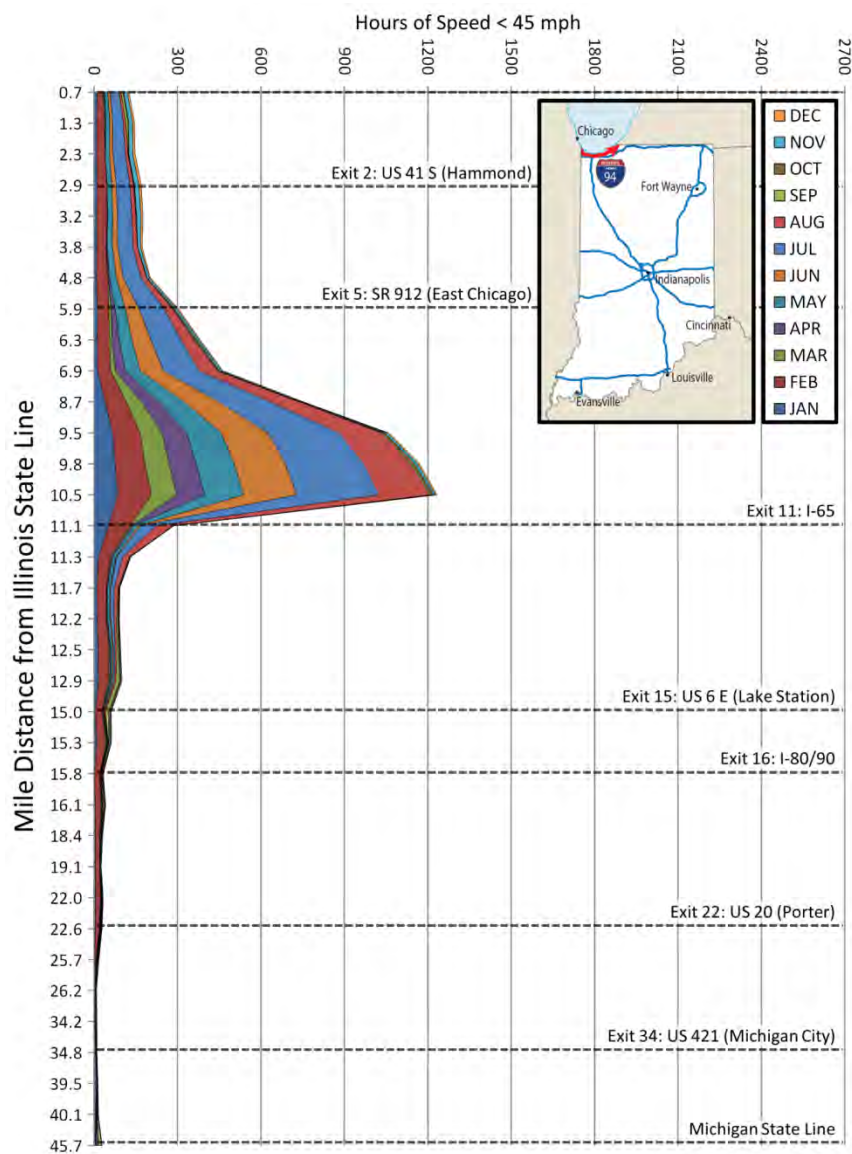
(a) 2011



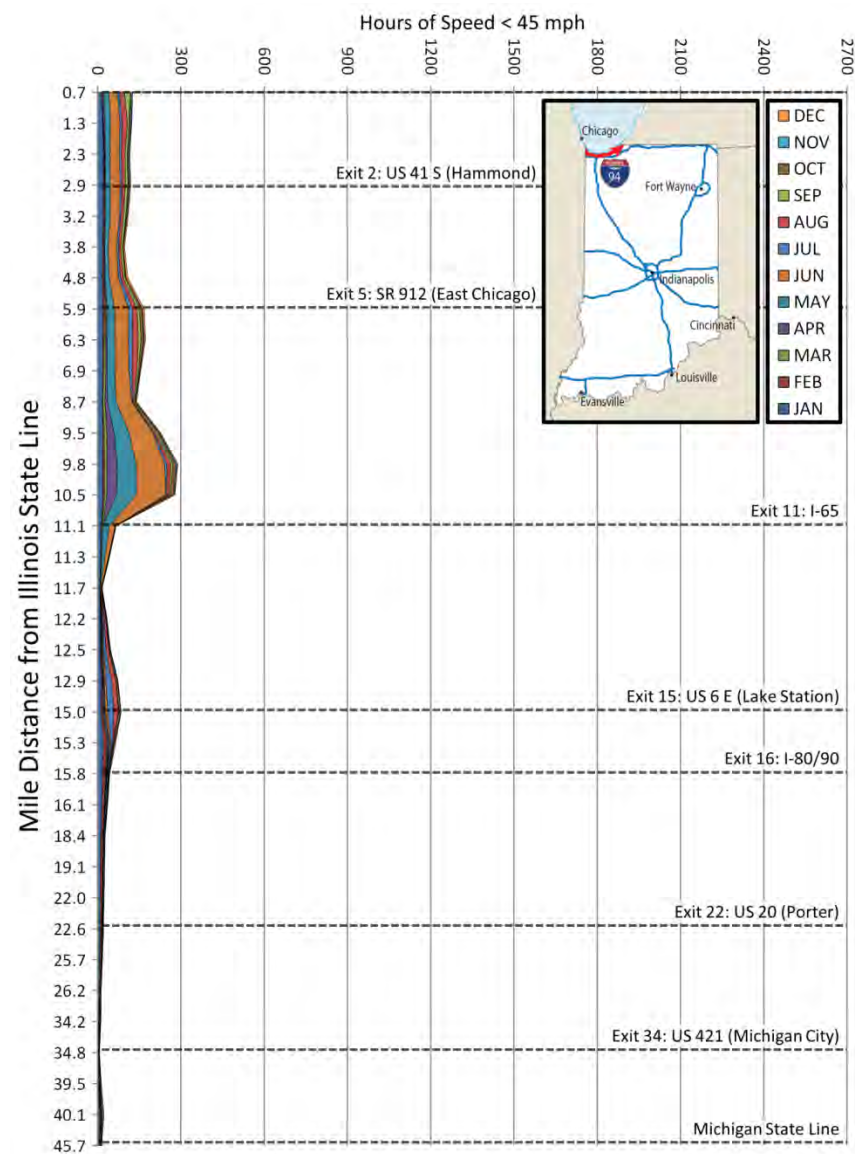
(b) 2012

Figure C.12. Congestion hours by month, inner loop I-465.



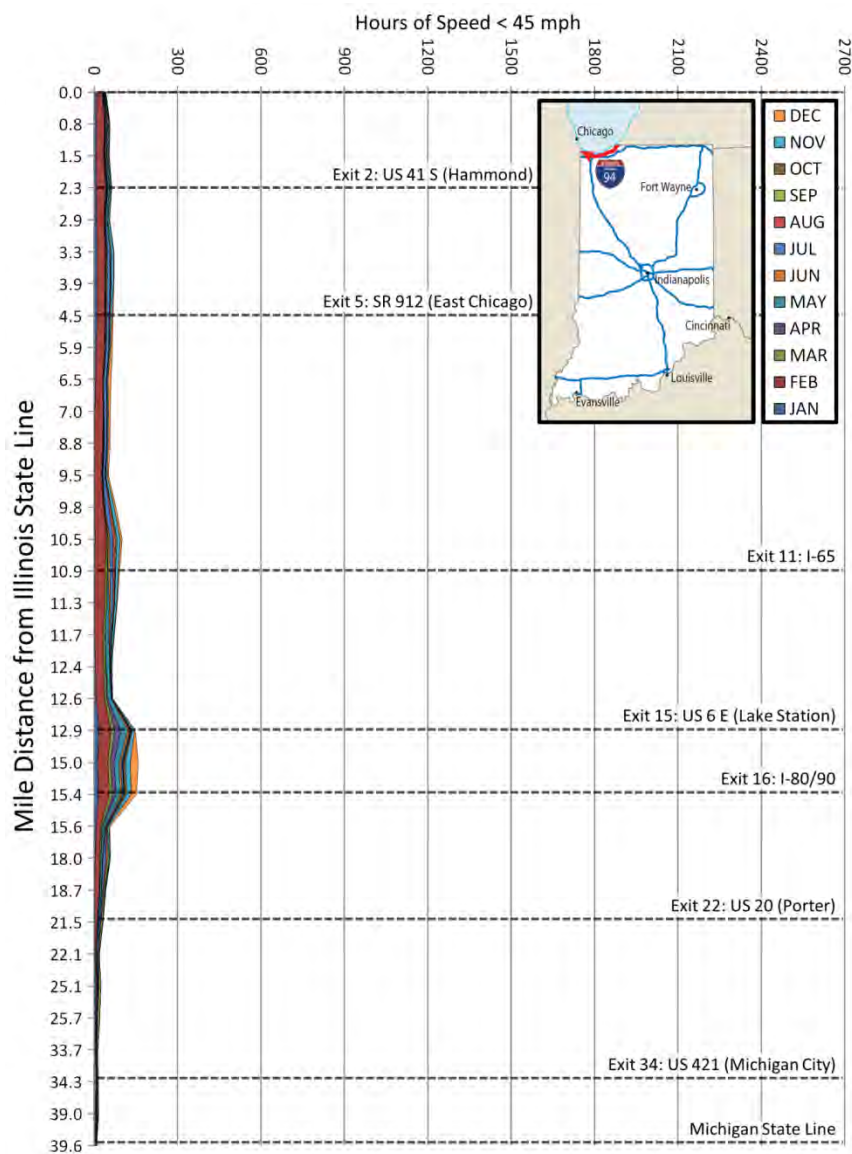


(a) 2011

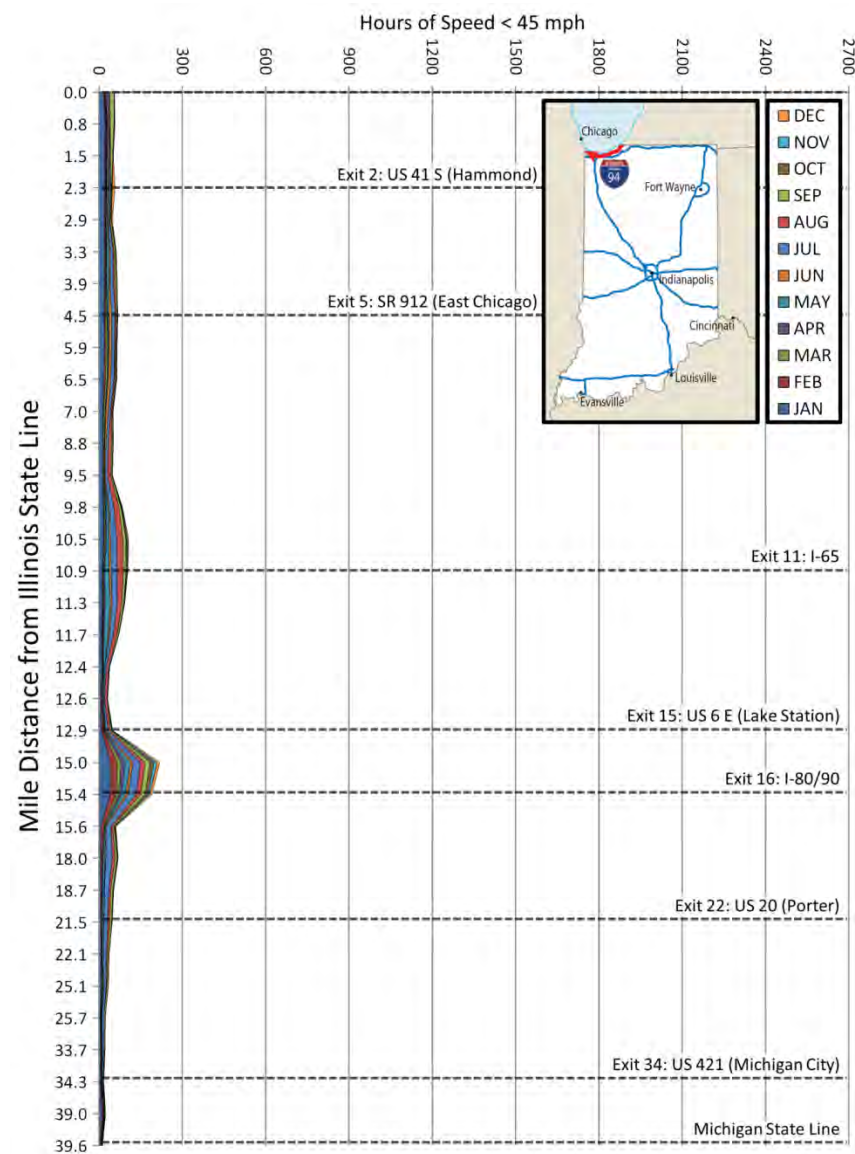


(b) 2012

Figure C.13. Congestion hours by month, eastbound I-94.



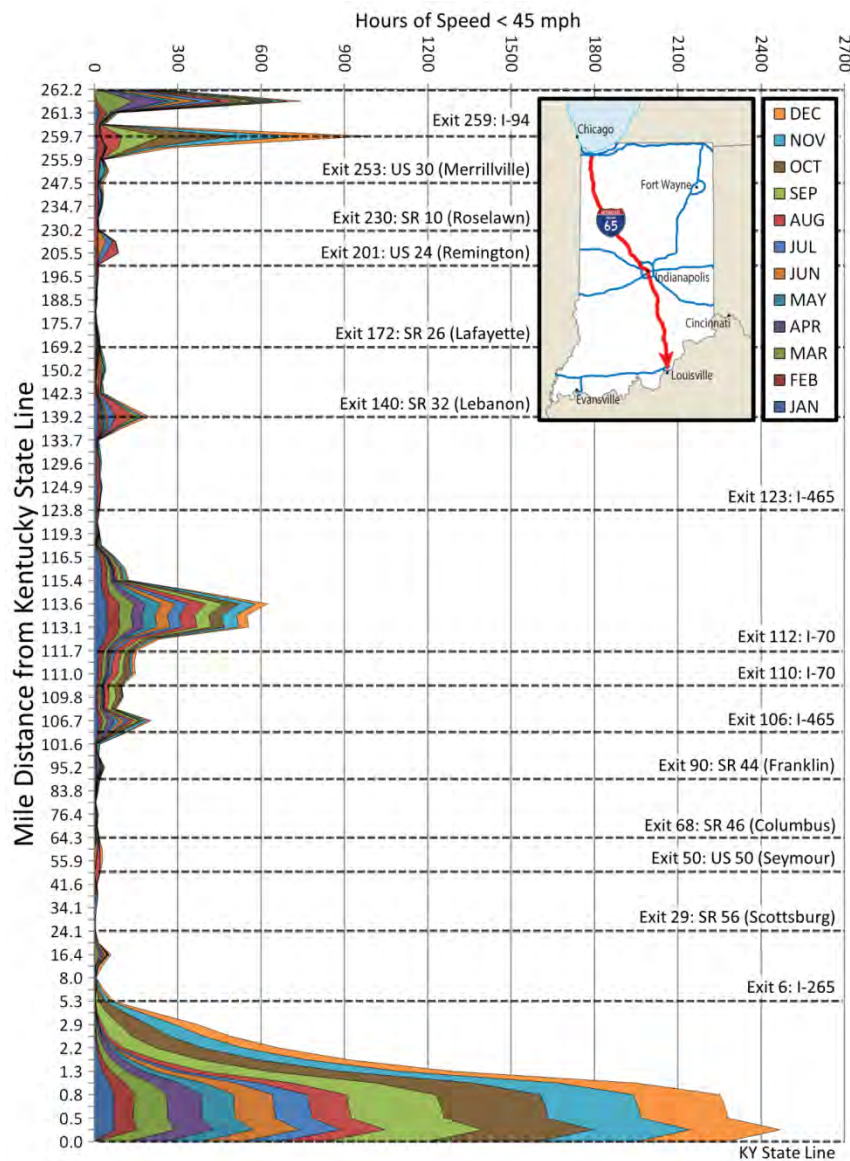
(a) 2011



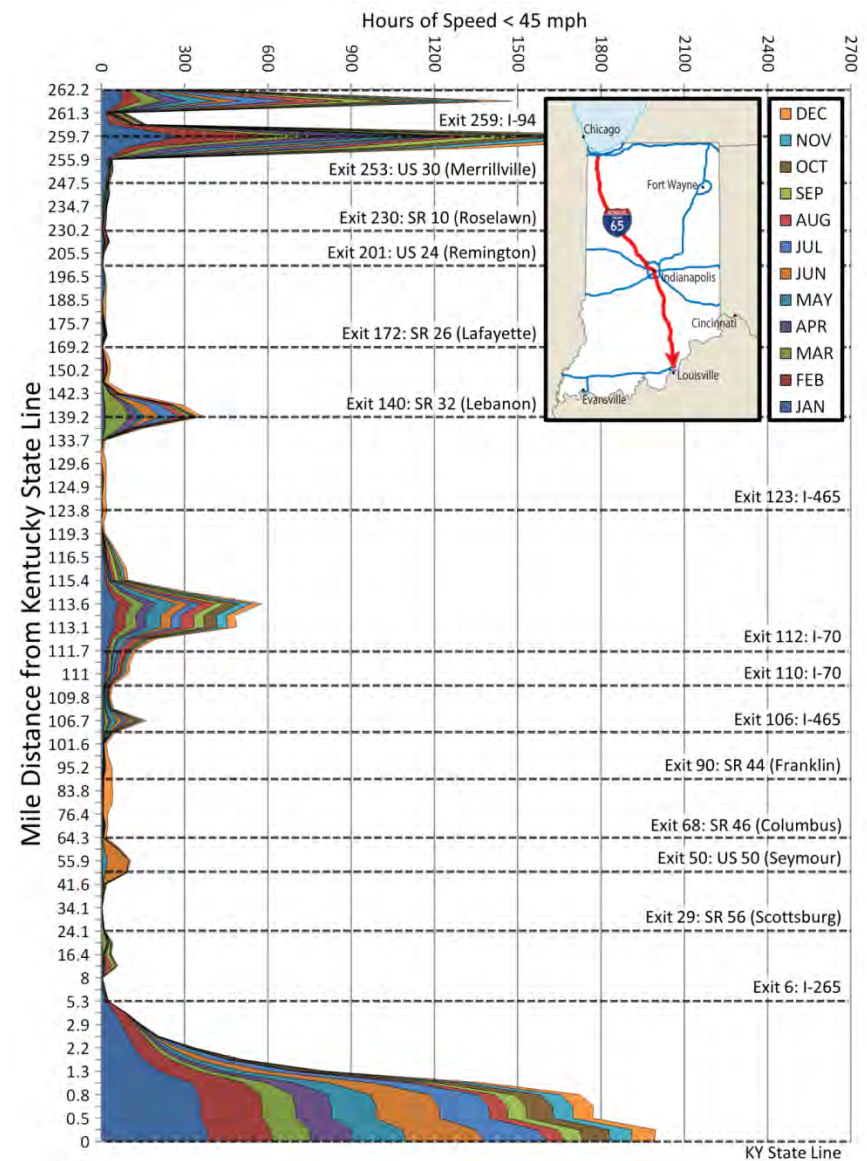
(b) 2012

Figure C.14. Congestion hours by month, westbound I-94.





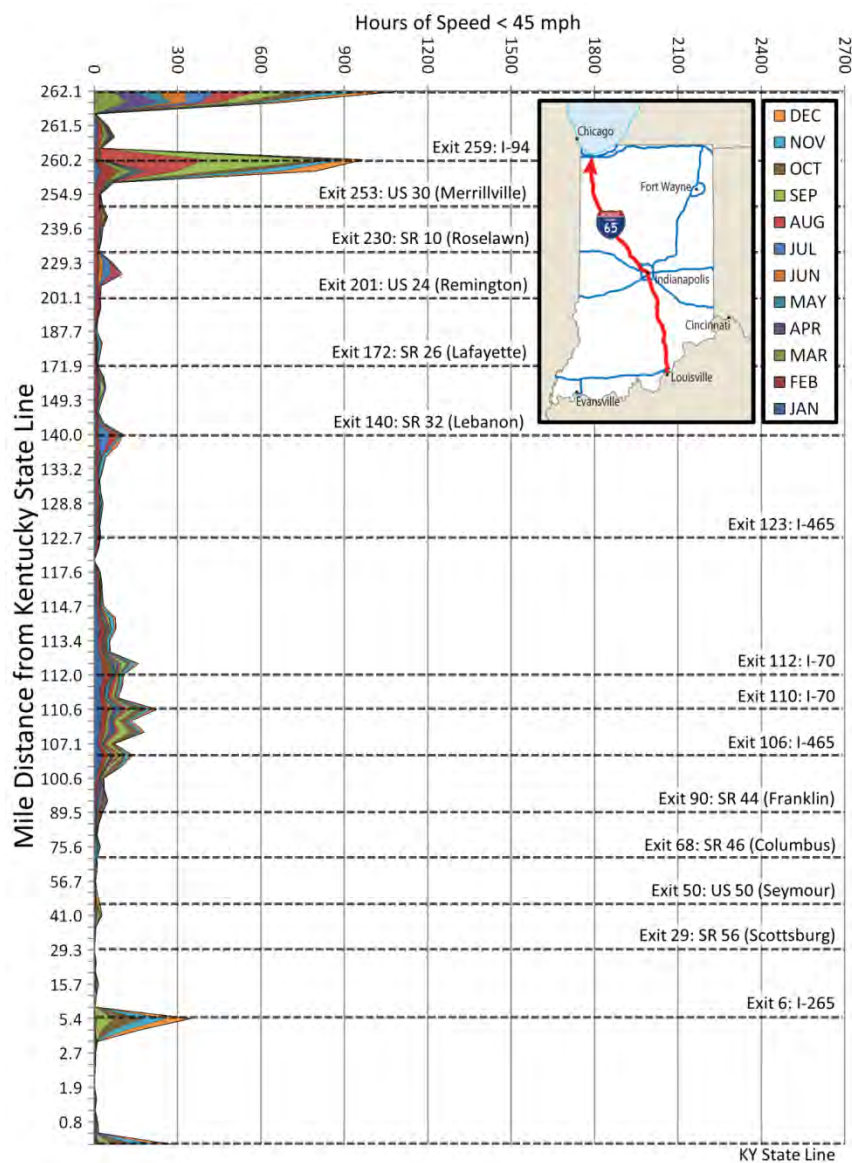
(a) 2011



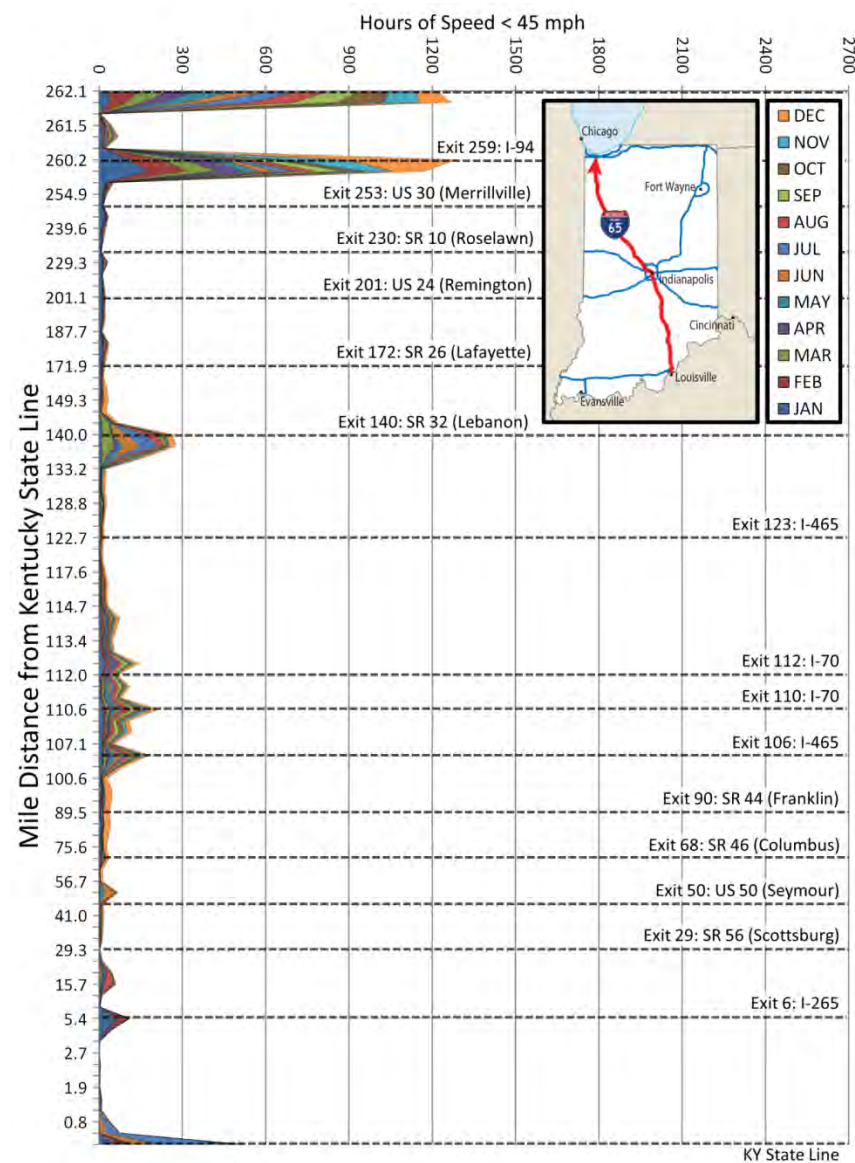
(b) 2012

Figure C.15. Congestion hours by month with scaled horizontal axis, southbound I-65.



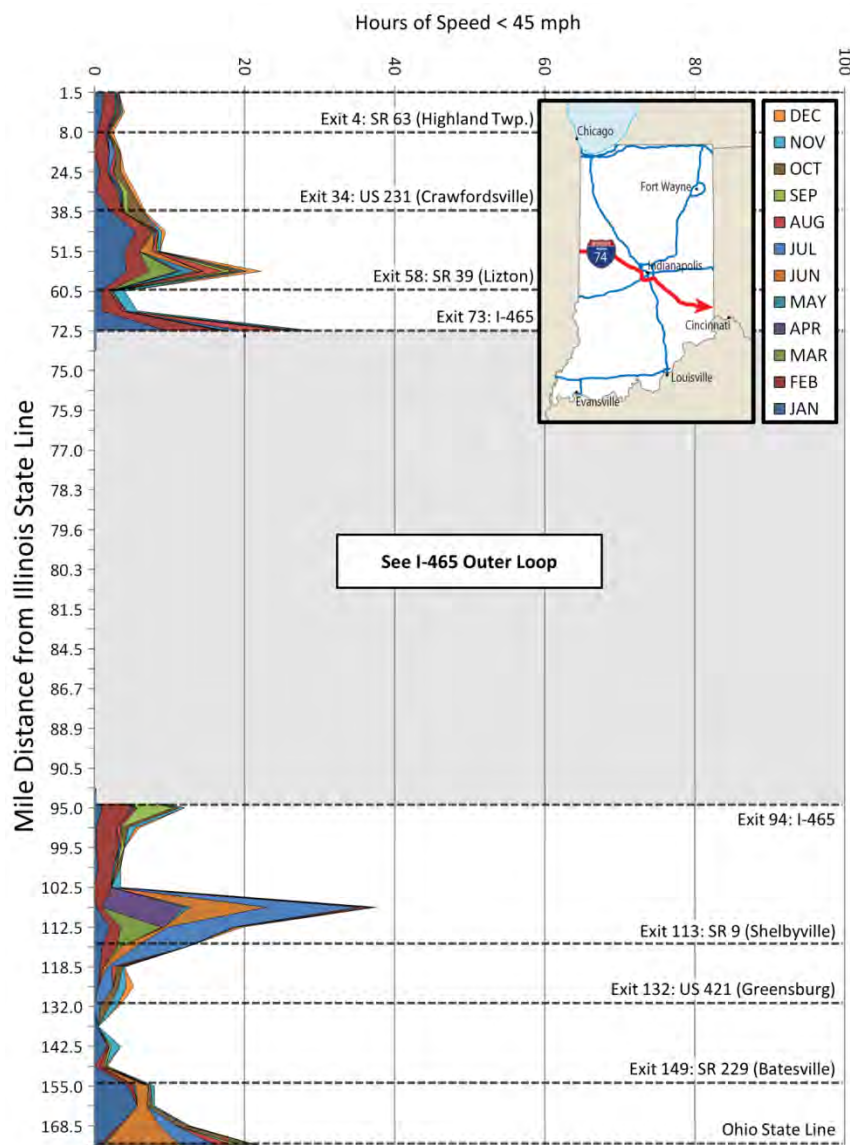


(a) 2011

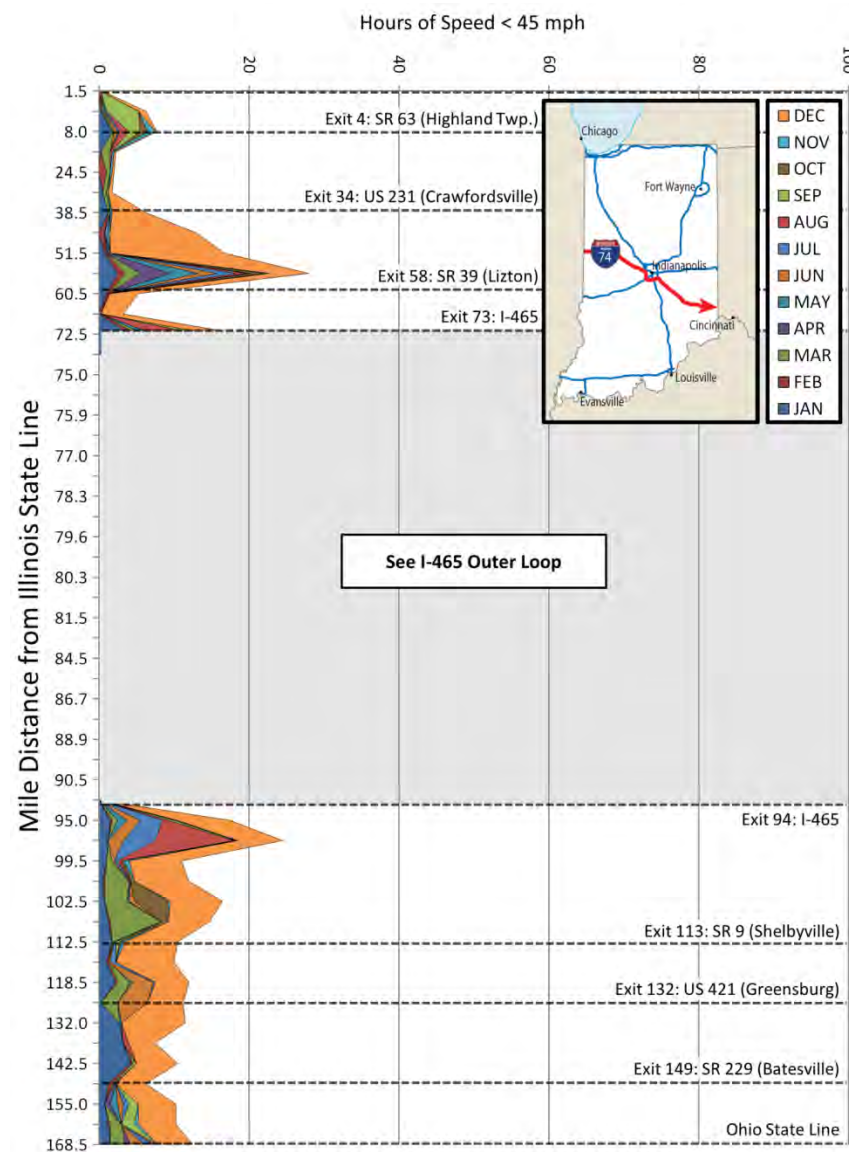


(b) 2012

Figure C.16. Congestion hours by month with scaled horizontal axis, northbound I-65.



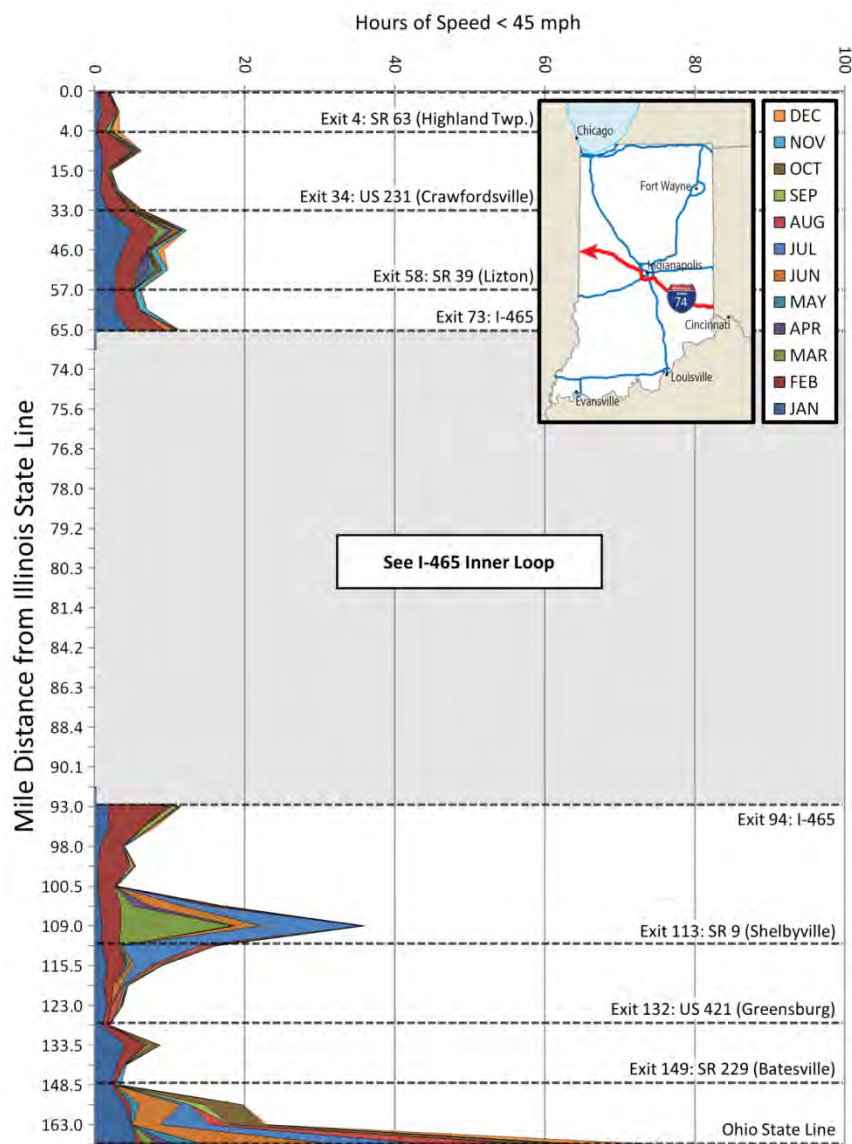
(a) 2011



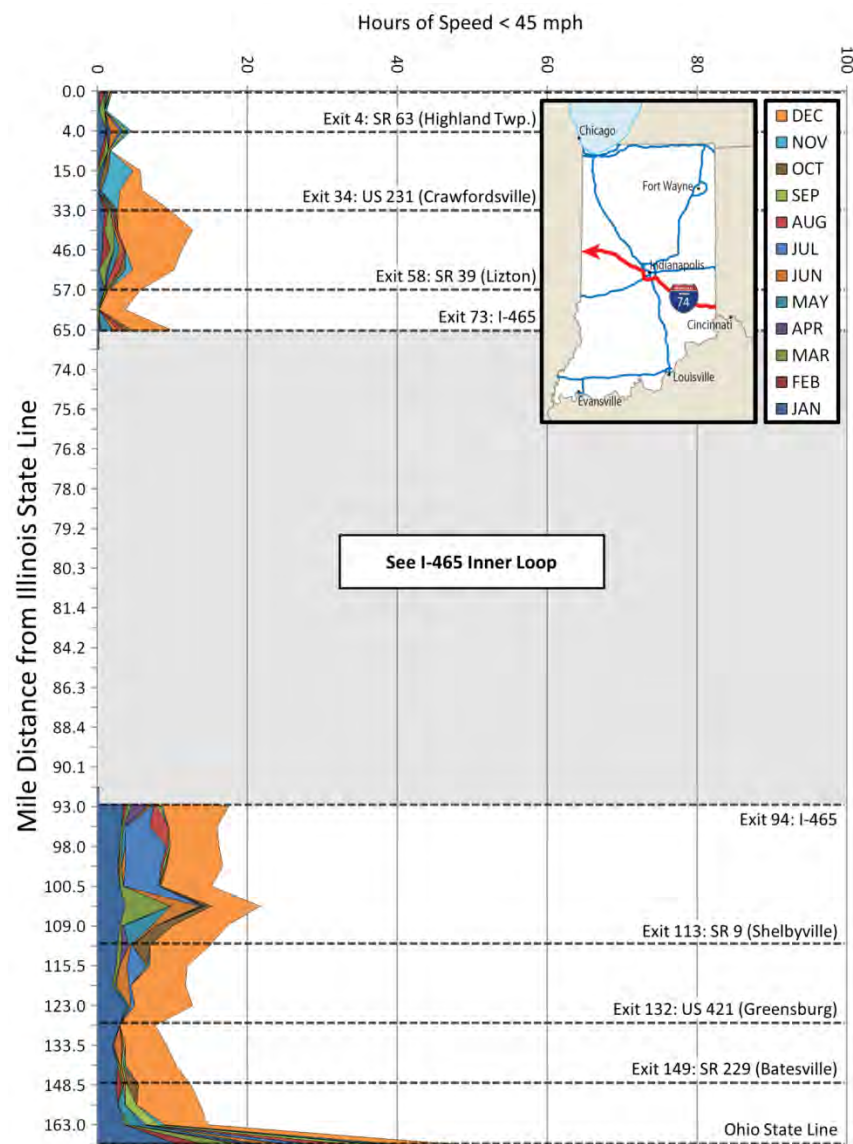
(b) 2012

Figure C.17. Congestion hours by month with scaled horizontal axis, eastbound I-74.





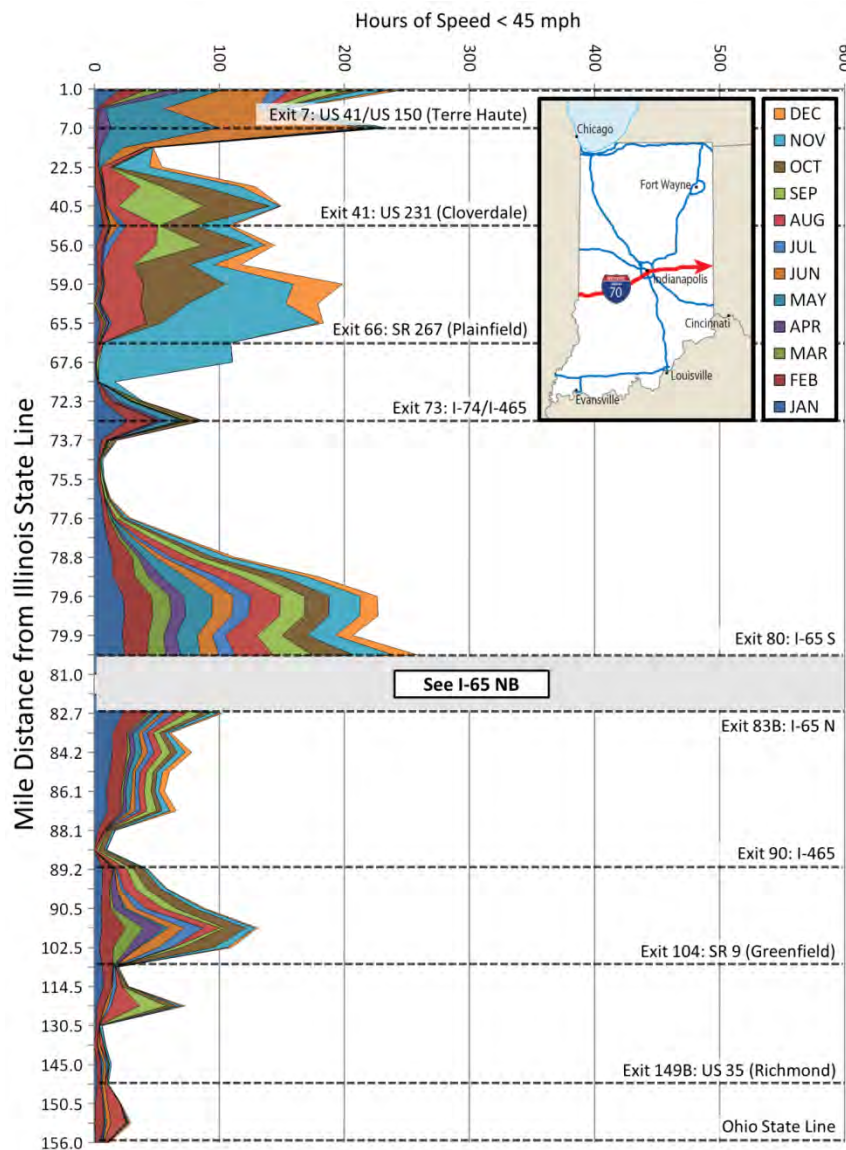
(a) 2011



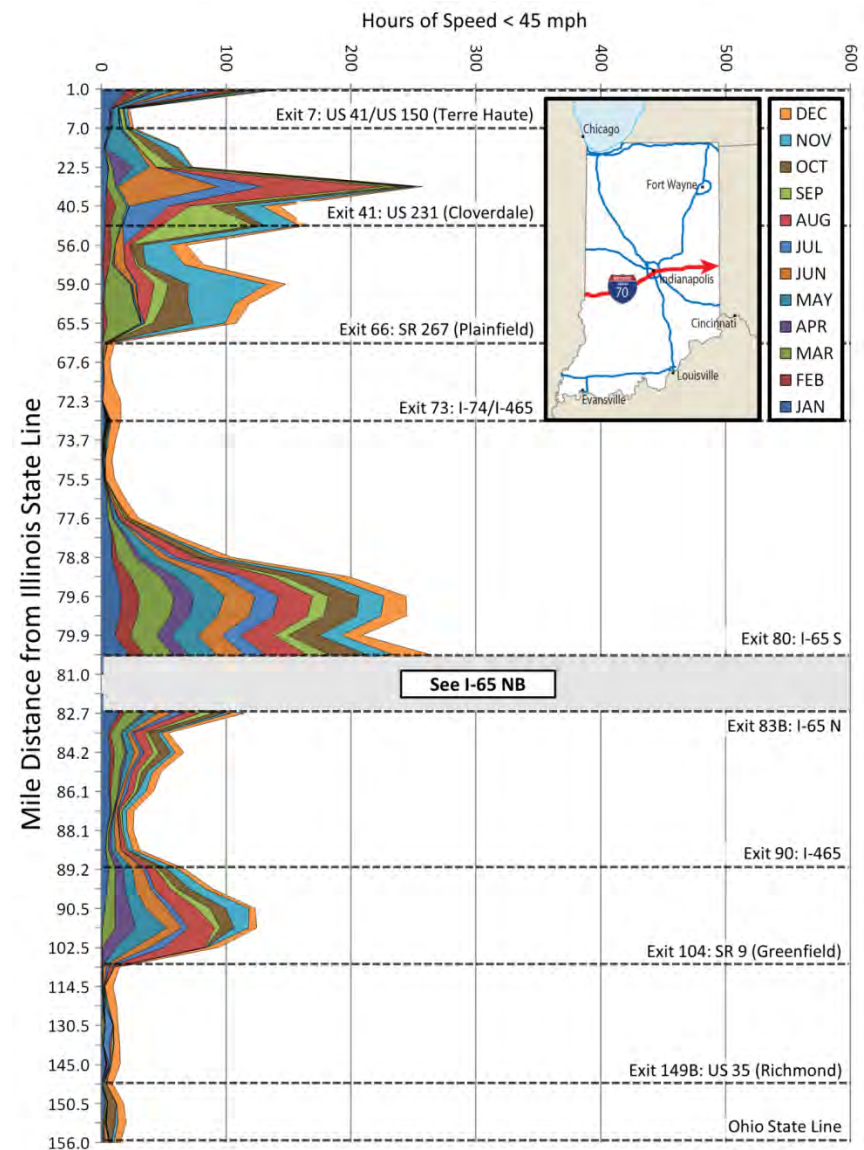
(b) 2012

Figure C.18. Congestion hours by month with scaled horizontal axis, westbound I-74.



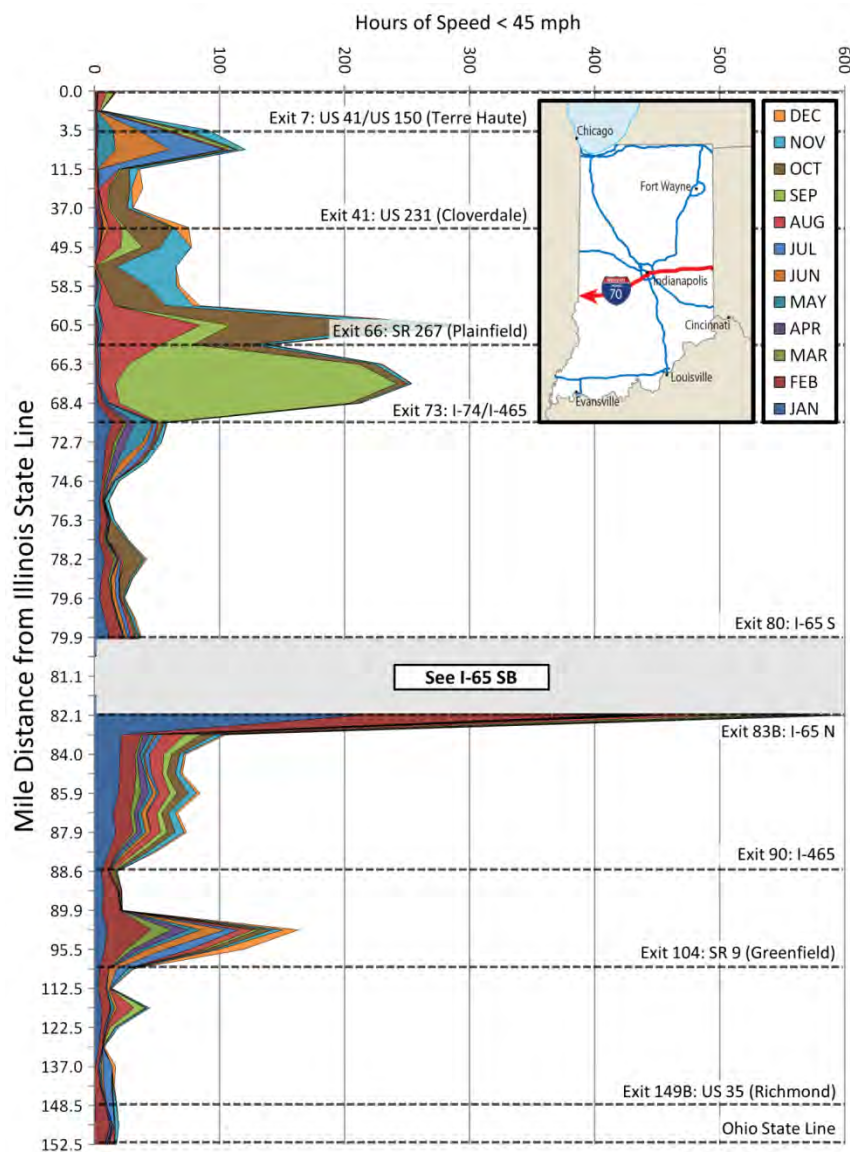


(a) 2011

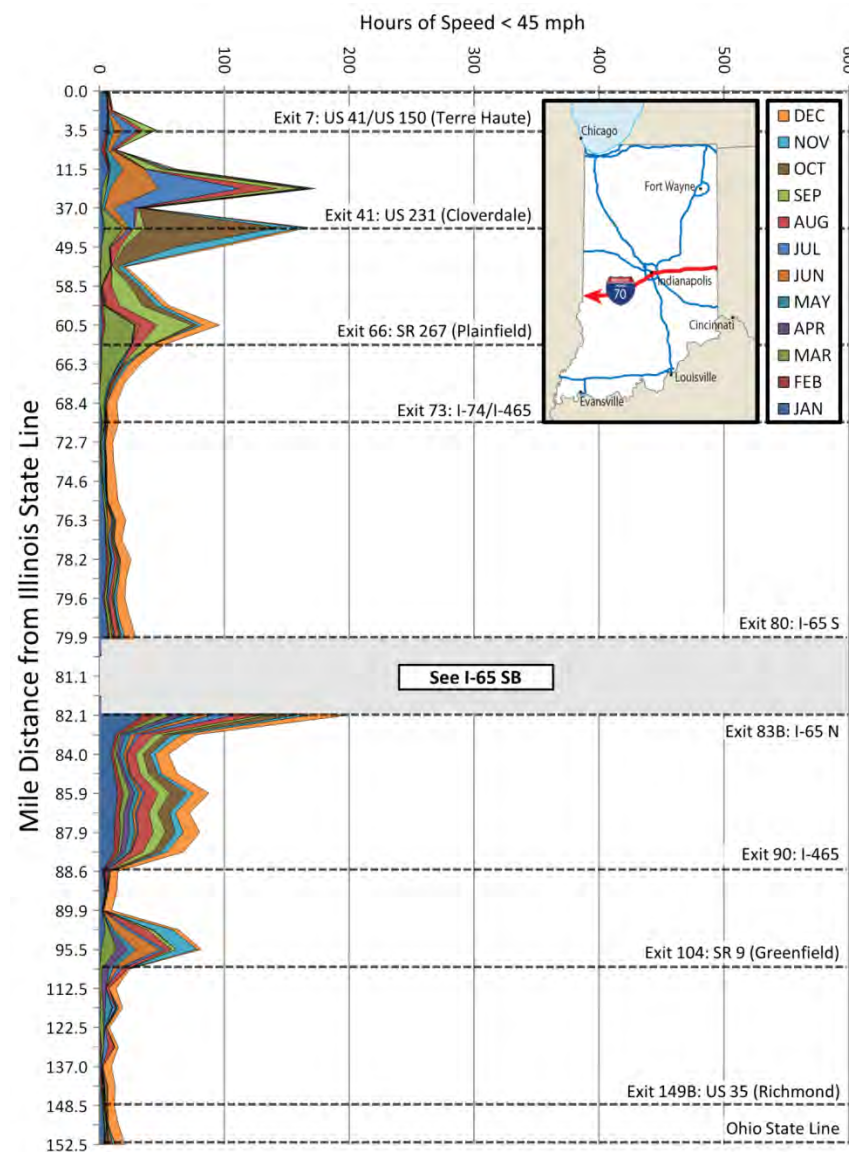


(b) 2012

Figure C.19. Congestion hours by month with scaled horizontal axis, eastbound I-70.



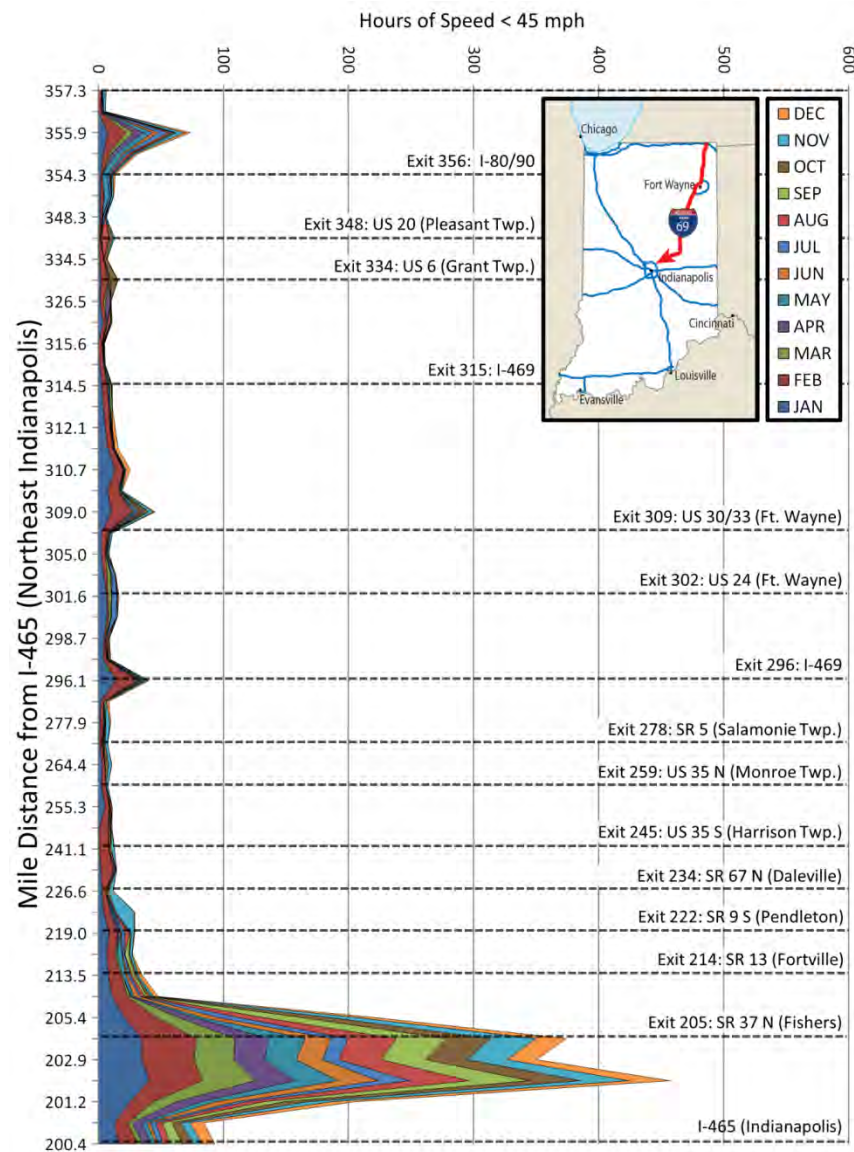
(a) 2011



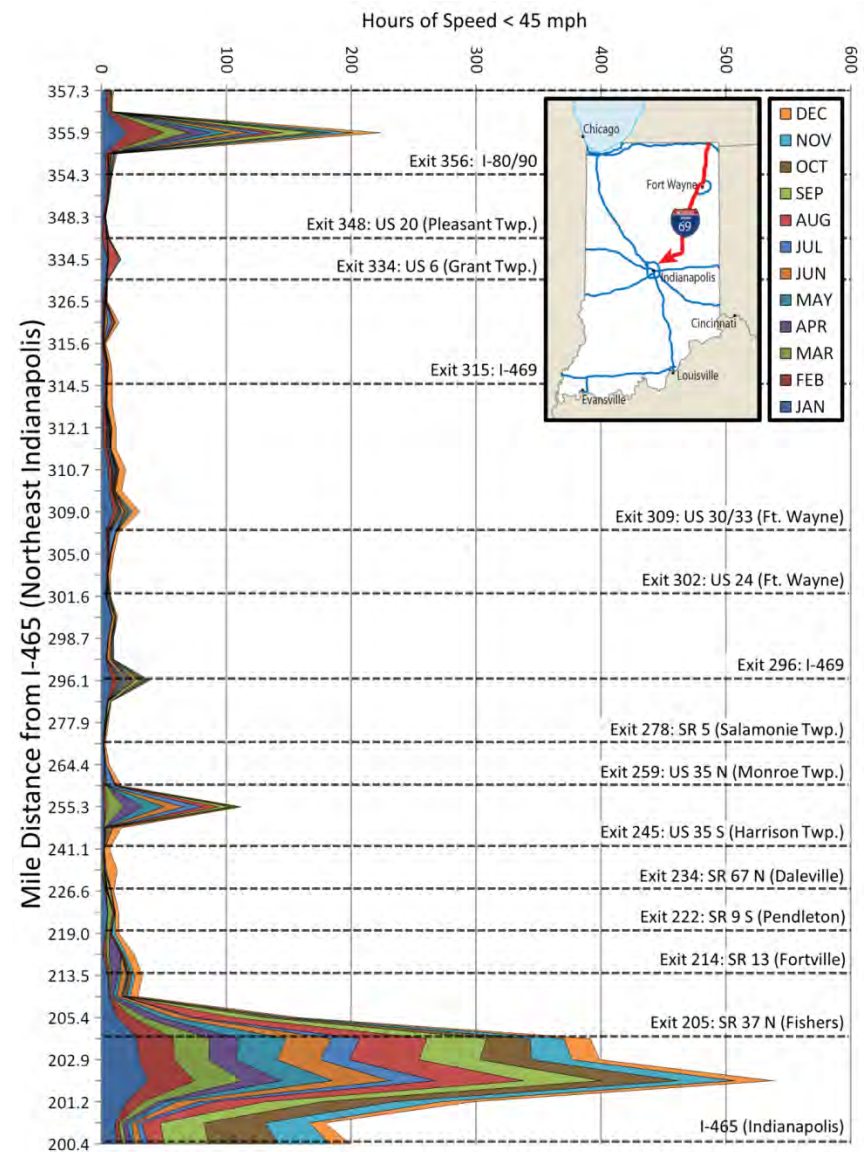
(b) 2012

Figure C.20. Congestion hours by month with scaled horizontal axis, westbound I-70.





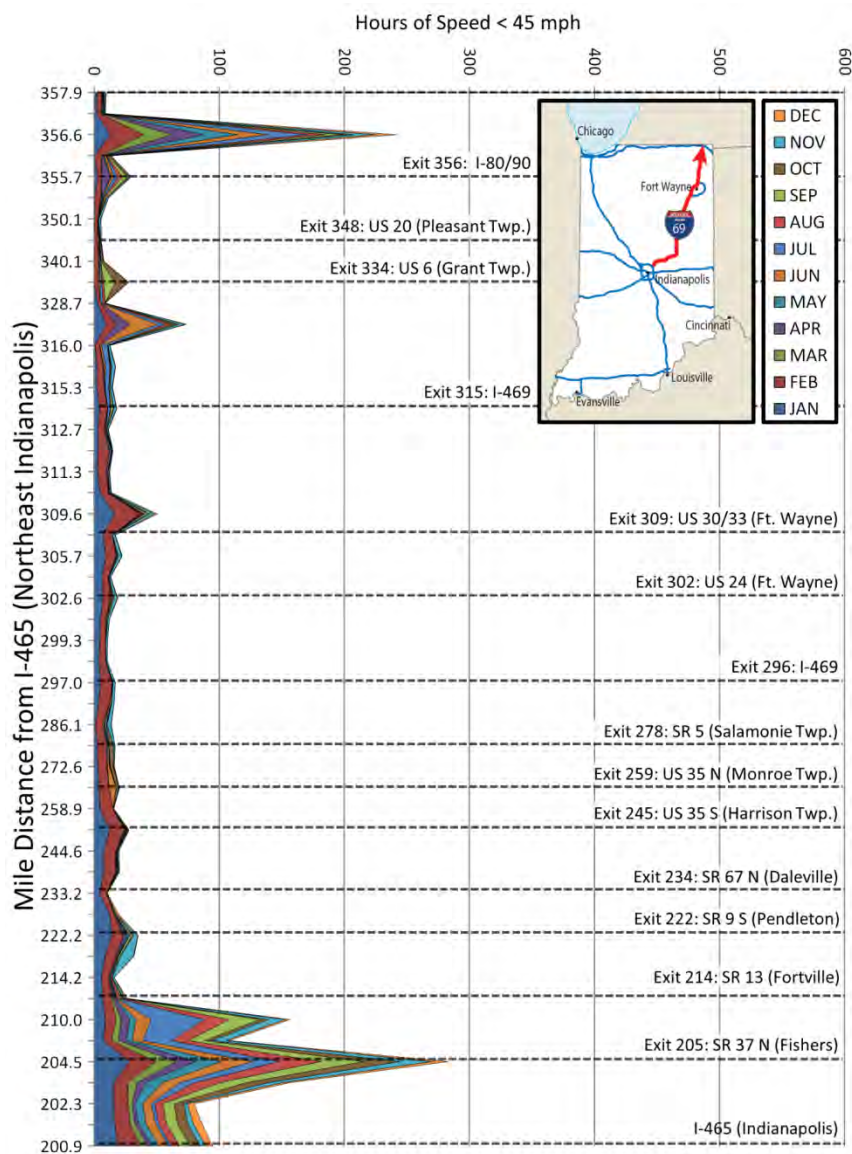
(a) 2011



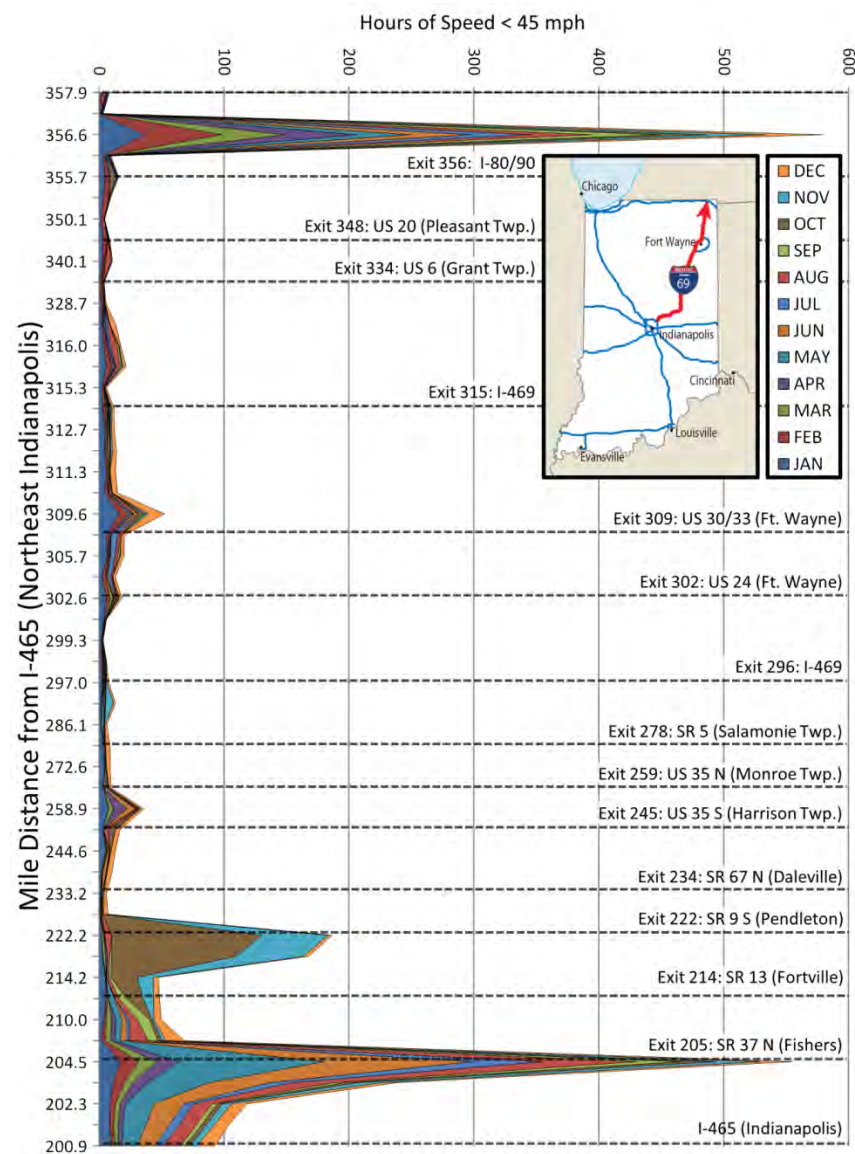
(b) 2012

Figure C.21. Congestion hours by month with scaled horizontal axis, southbound I-69.



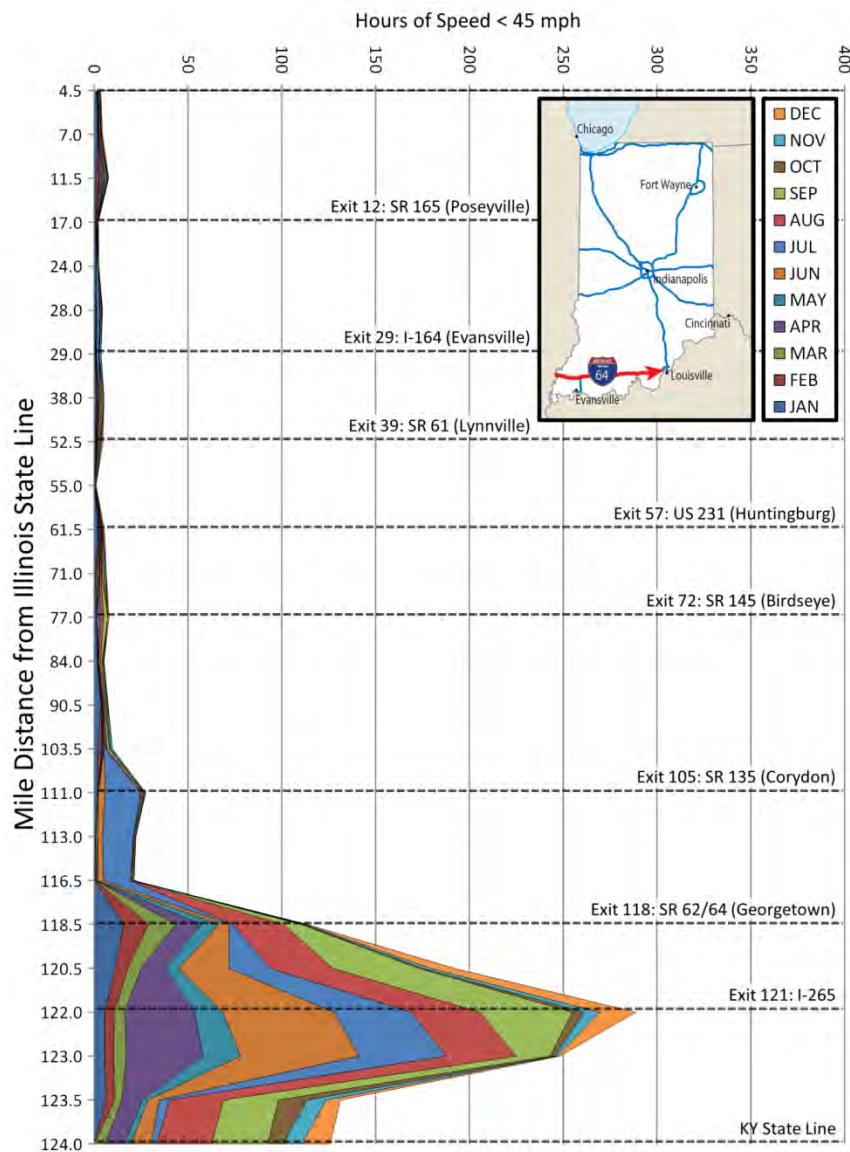


(a) 2011

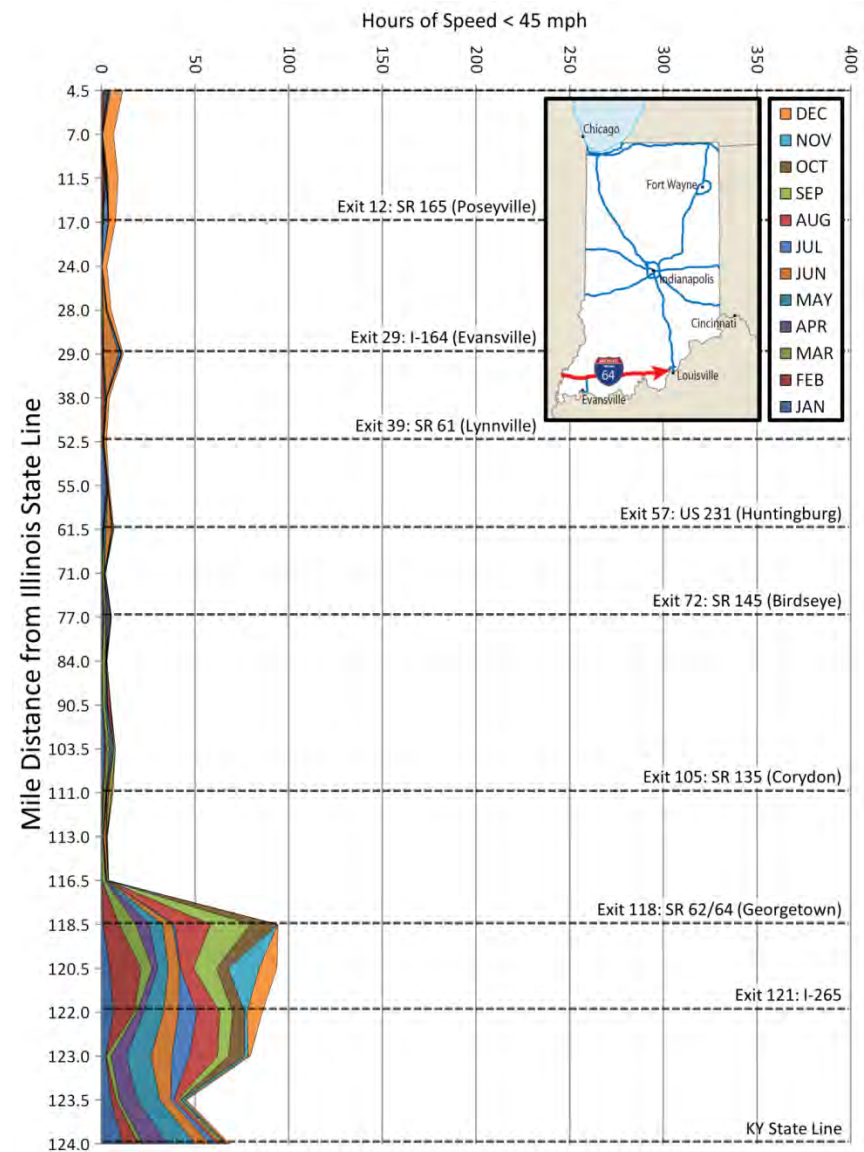


(b) 2012

Figure C.22. Congestion hours by month with scaled horizontal axis, northbound I-69.



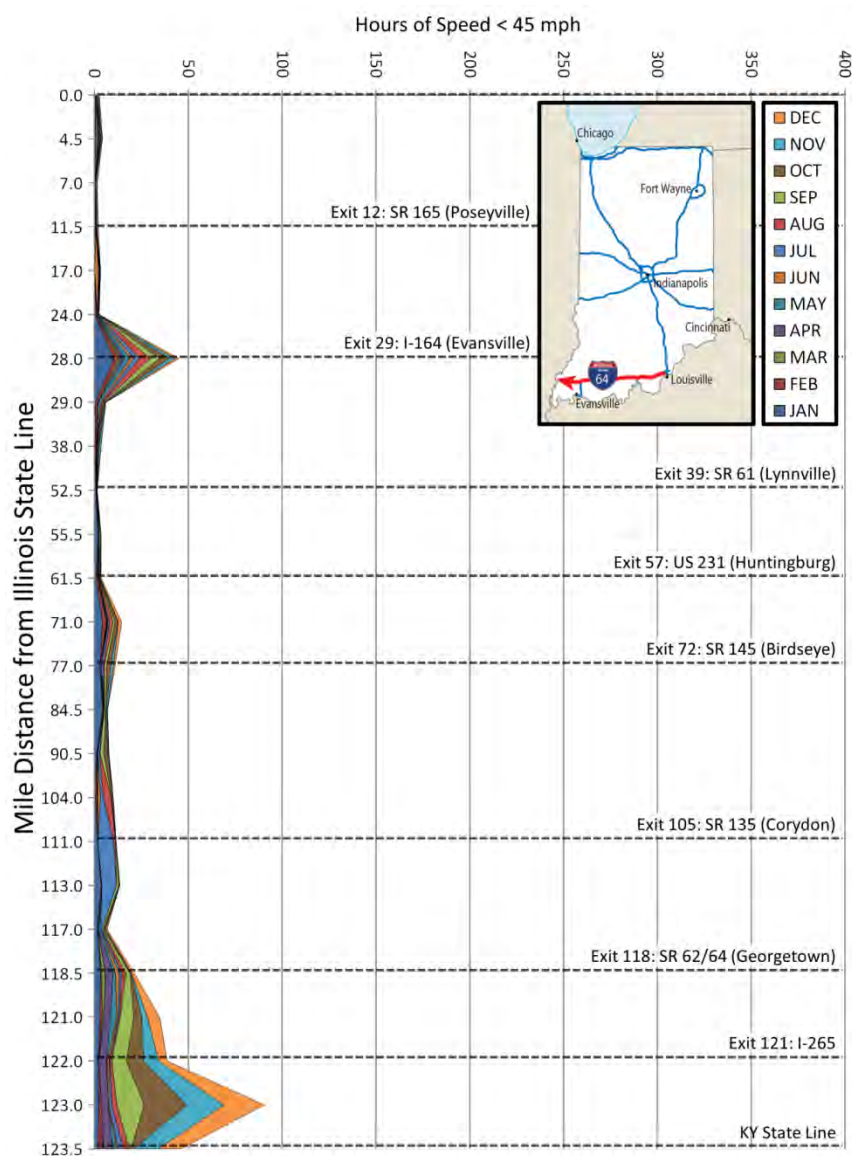
(a) 2011



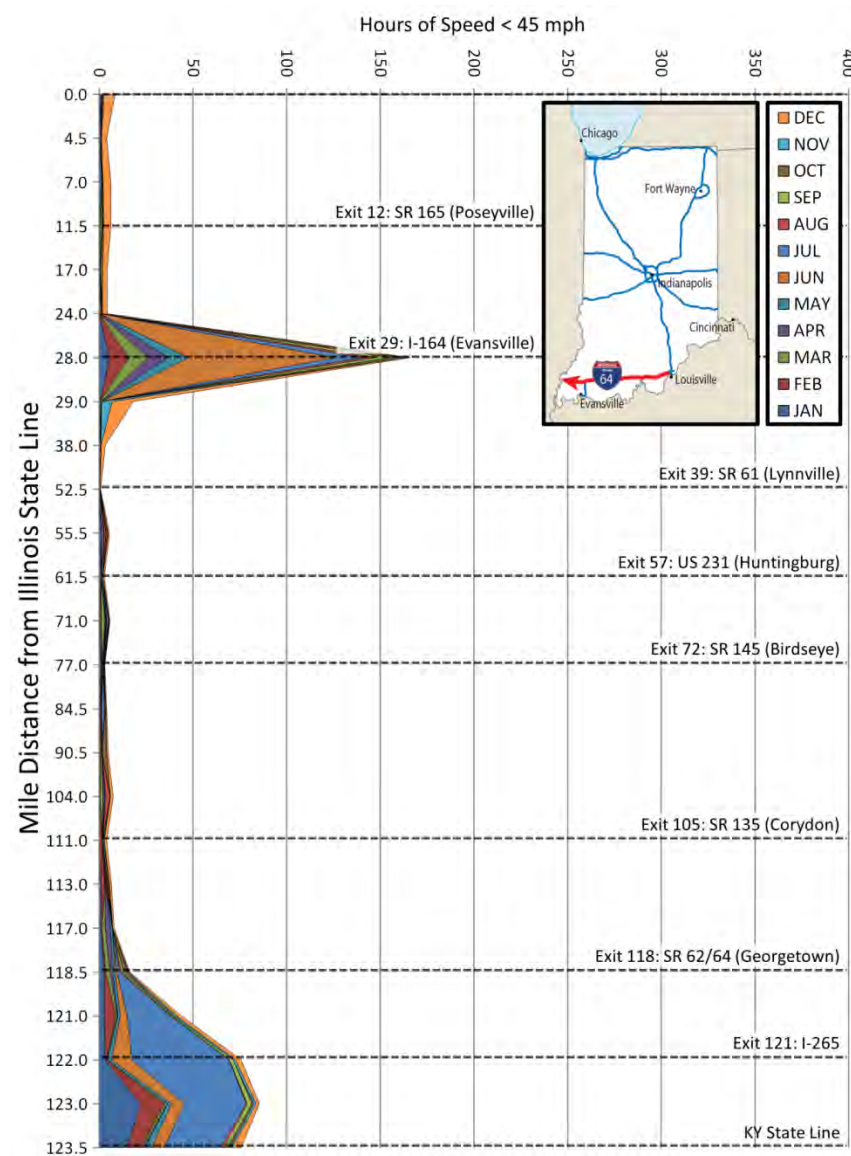
(b) 2012

Figure C.23. Congestion hours by month with scaled horizontal axis, eastbound I-64.





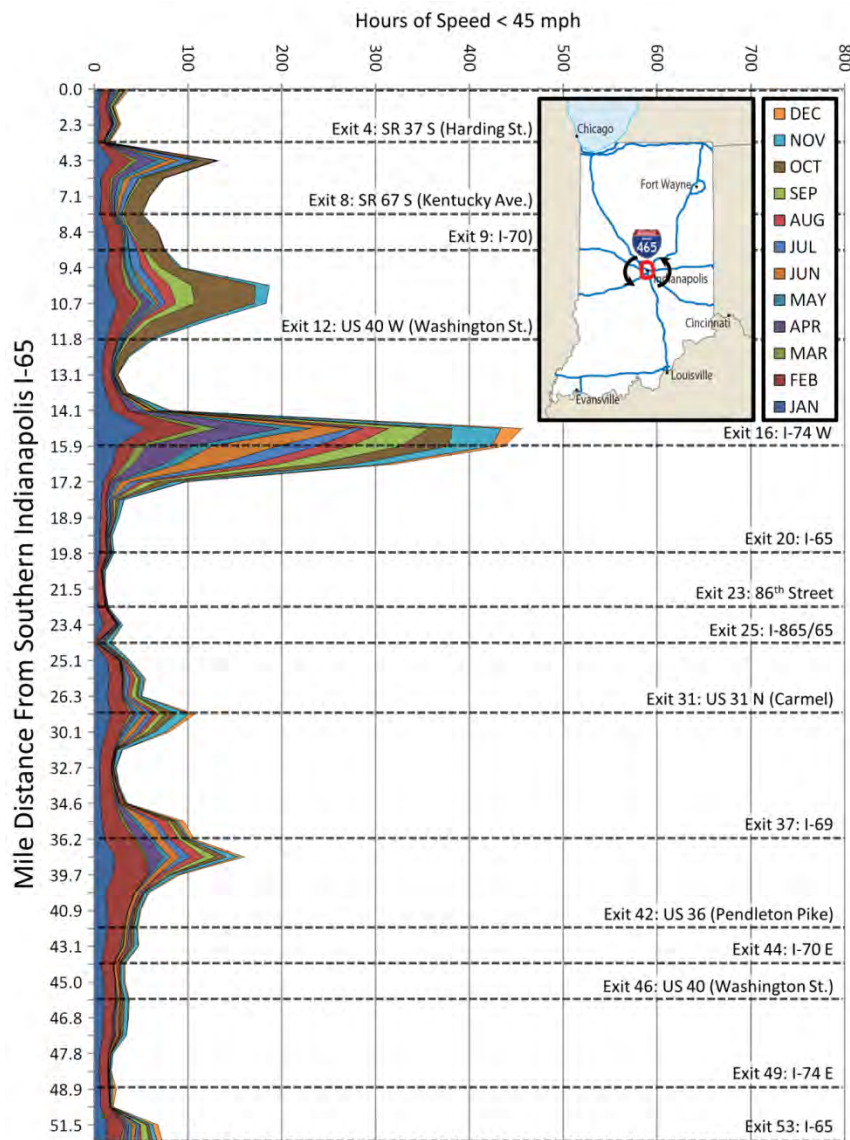
(a) 2011



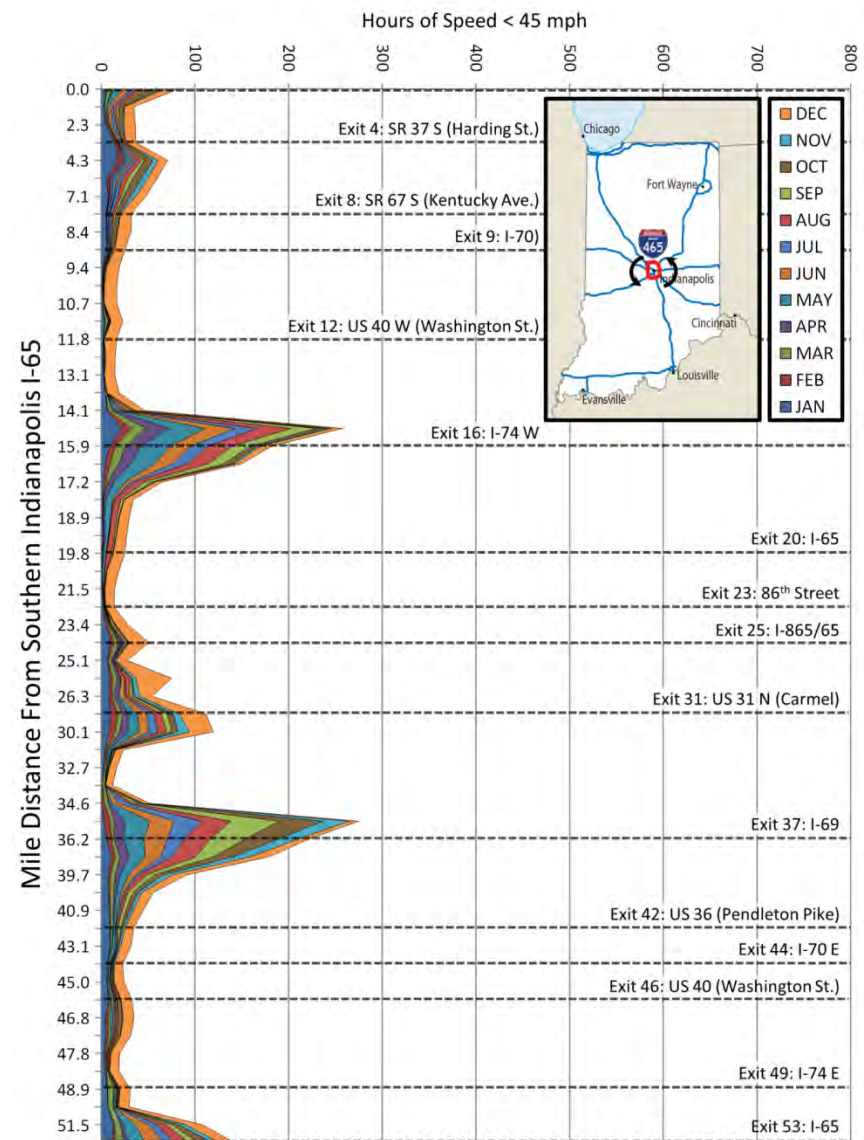
(b) 2012

Figure C.24. Congestion hours by month with scaled horizontal axis, westbound I-64.



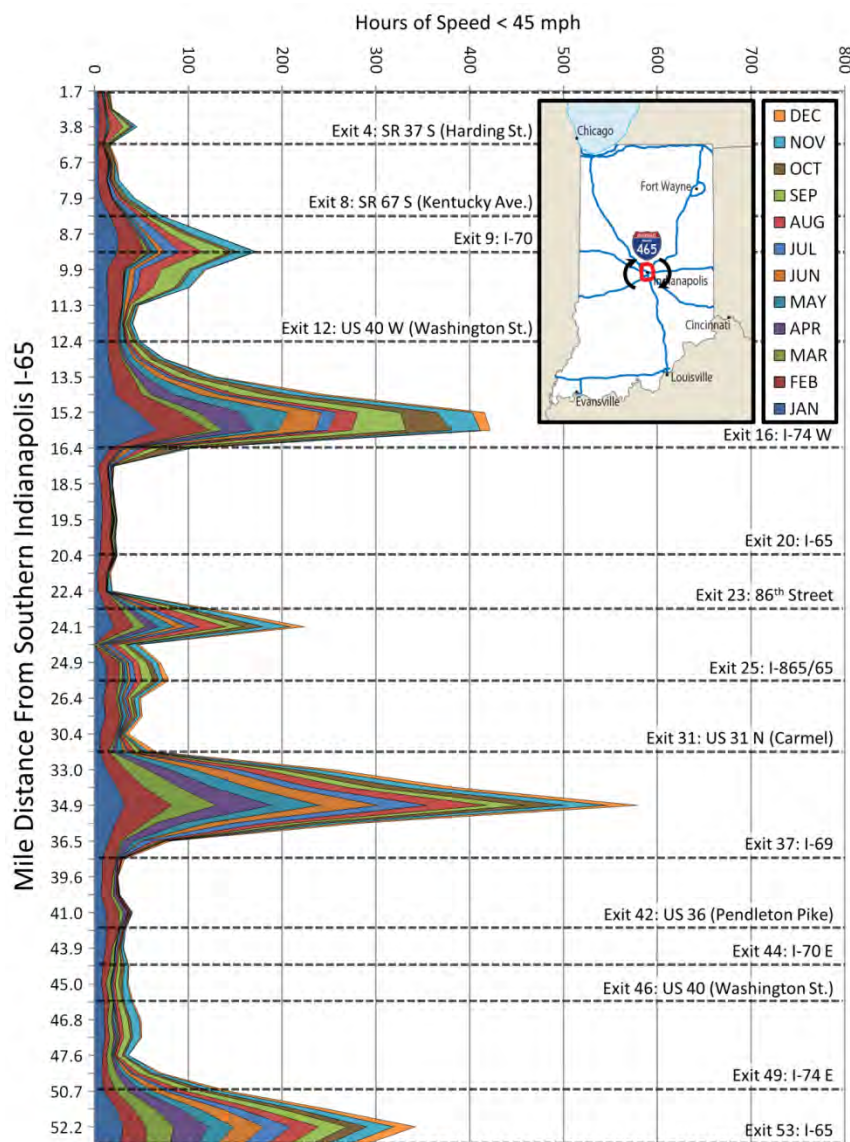


(a) 2011

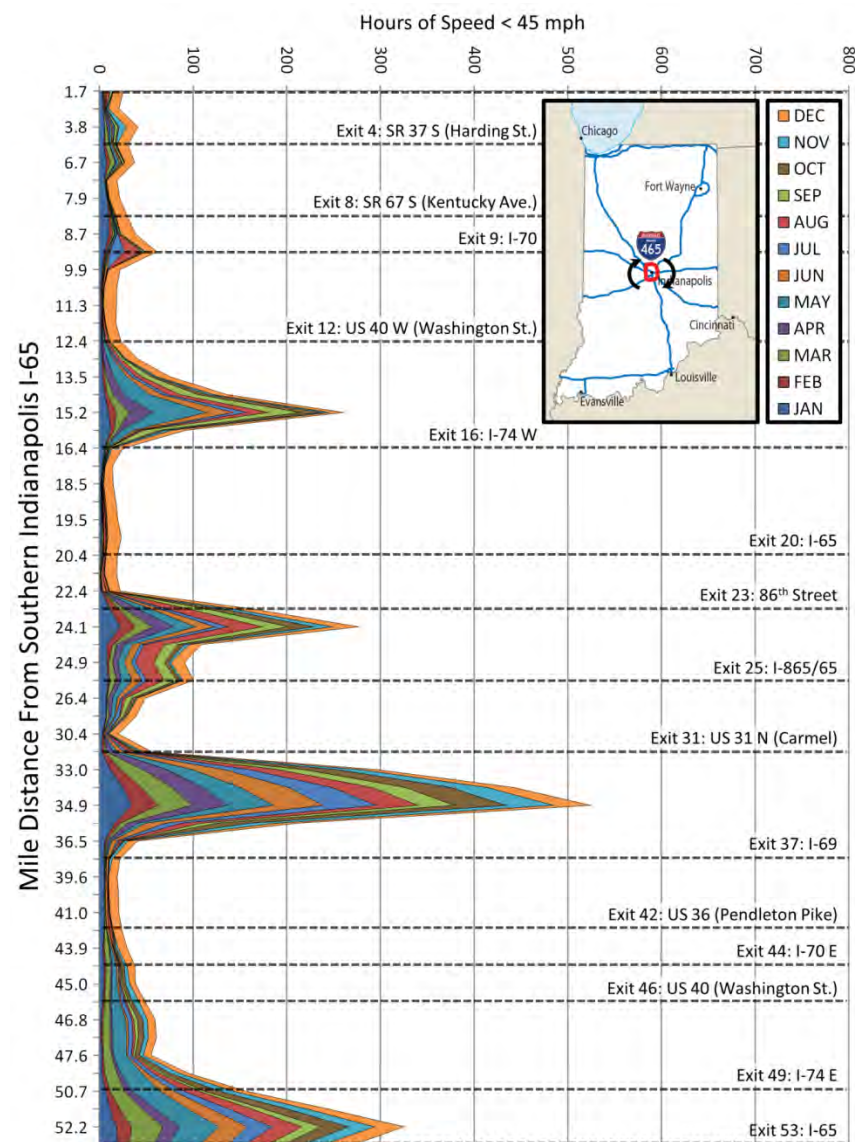


(b) 2012

Figure C.25. Congestion hours by month with scaled horizontal axis, outer loop I-465.



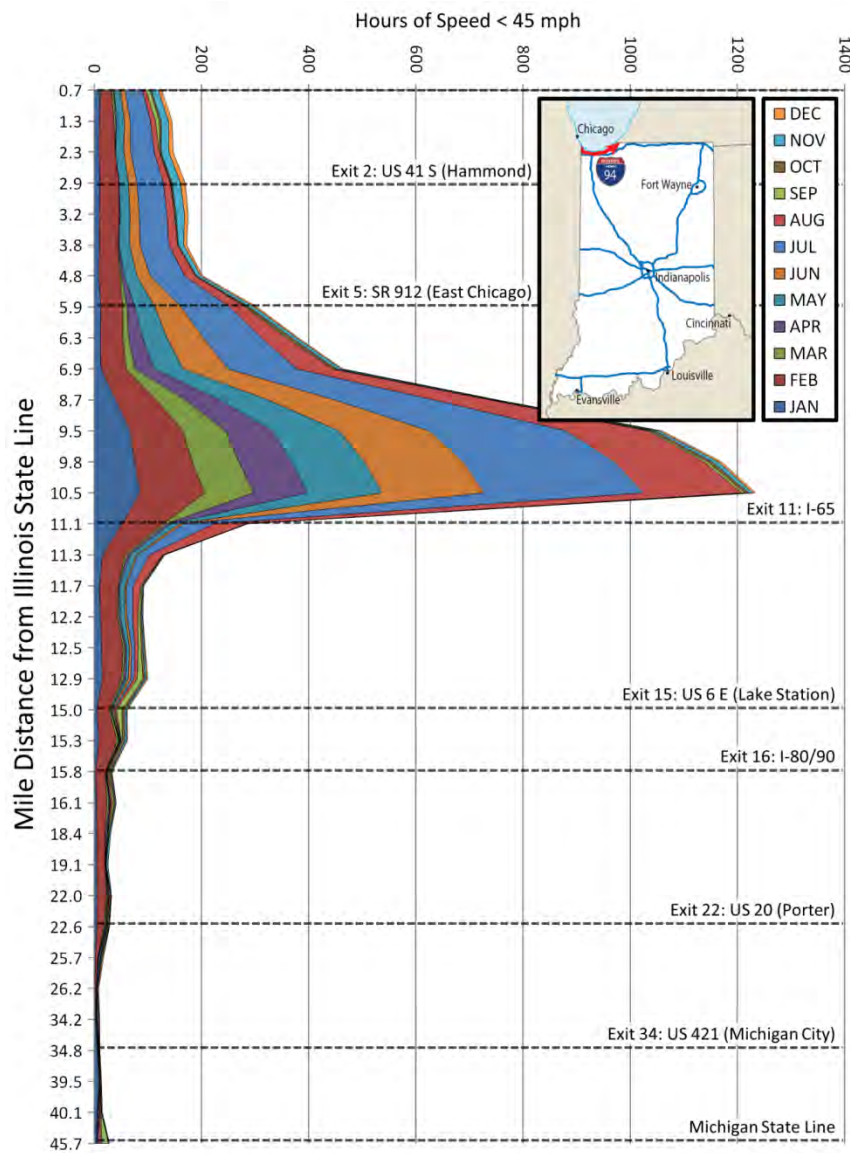
(a) 2011



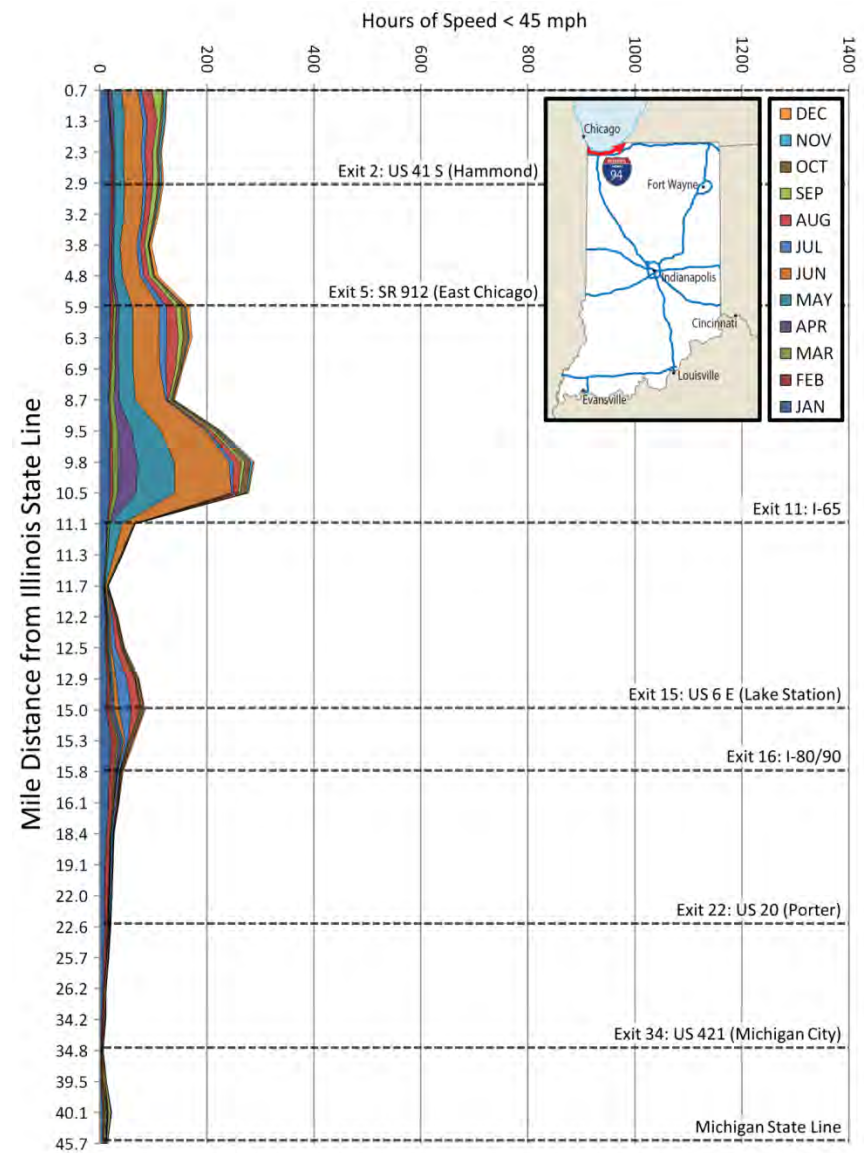
(b) 2012

Figure C.26. Congestion hours by month with scaled horizontal axis, inner loop I-465.





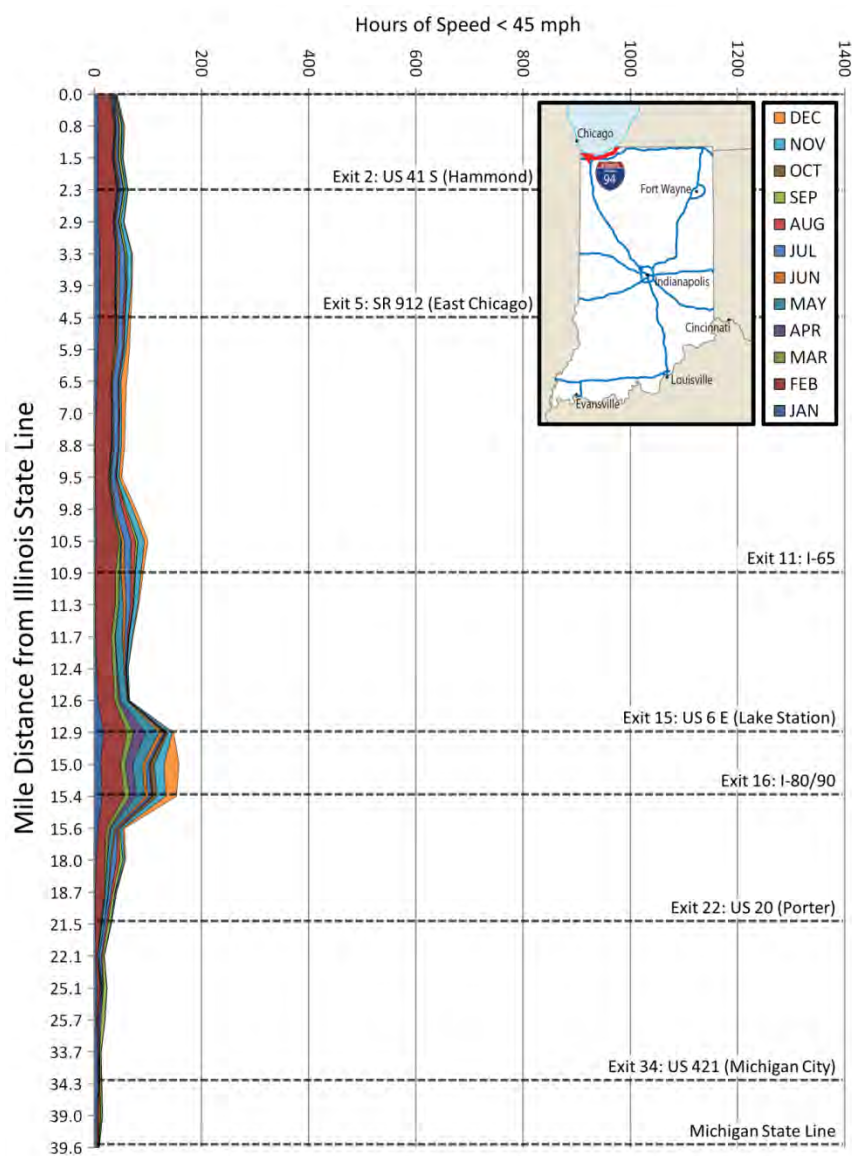
(a) 2011



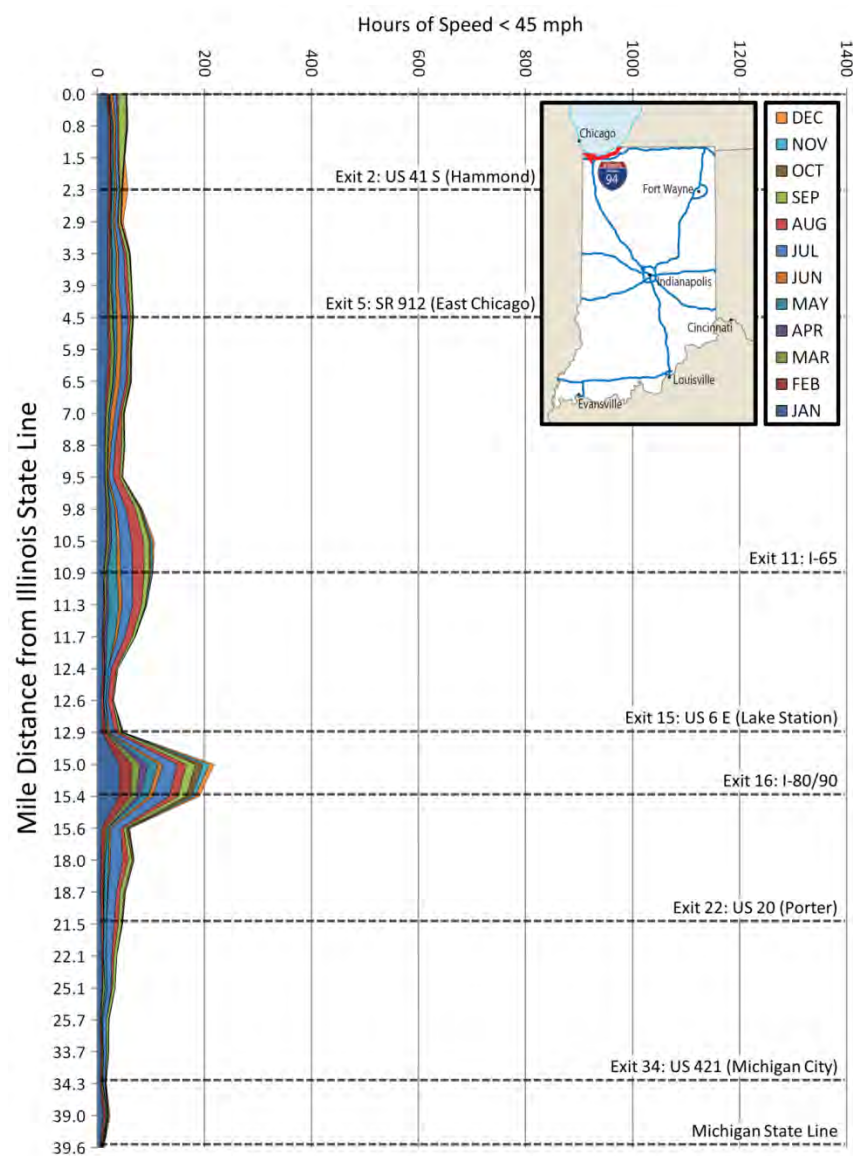
(b) 2012

Figure C.27. Congestion hours by month with scaled horizontal axis, eastbound I-94.





(a) 2011

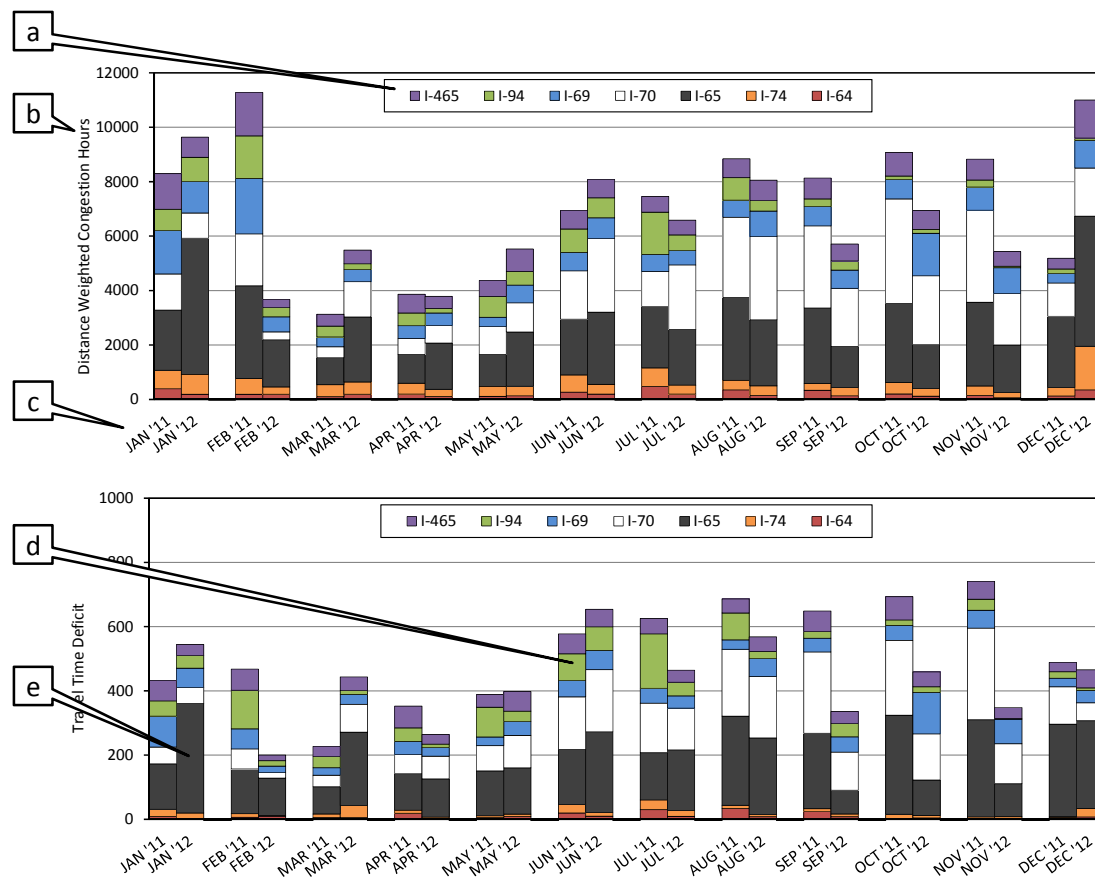


(b) 2012

Figure C.28. Congestion hours by month with scaled horizontal axis, westbound I-94.

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# Appendix D: Interstate Summary Statistics



**Summary:** The performance measure views presented in this report show the locations and severity of congestion in 2011 and 2012. These longitudinal comparisons between years are helpful for identifying changes in overall system performance

- a. Interstate legend
- b. Performance metric used in graph
- c. Month & year of data visualization
- d. I-94 Travel time deficit performance in June 2011
- e. I-65 Travel time deficit performance in Jan. 2012



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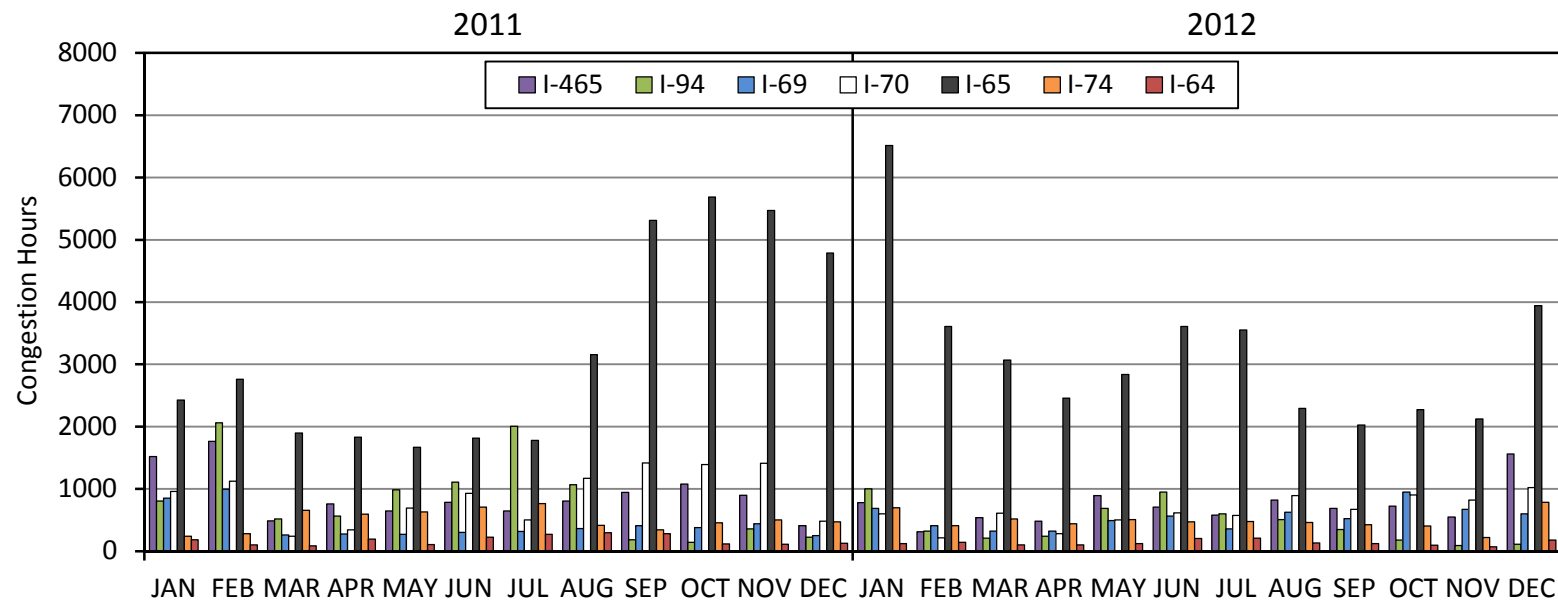


Figure D.1. Congestion hour summary for Indiana interstates (side by side).

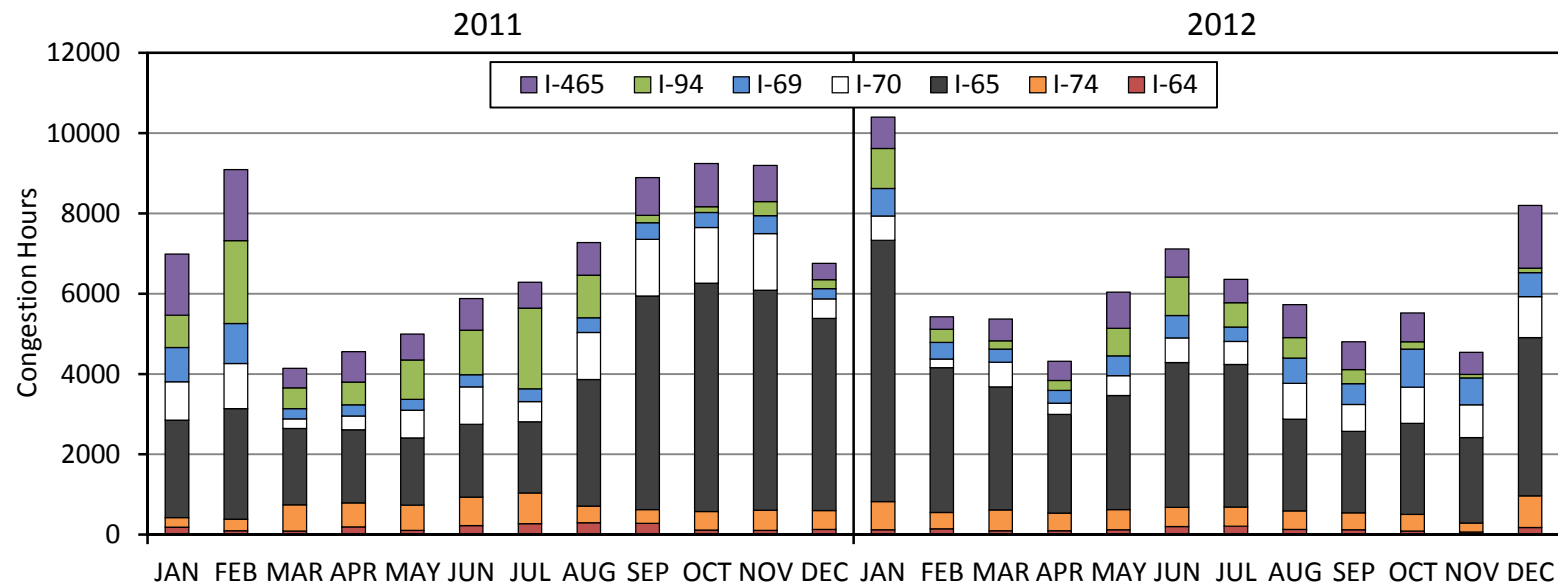
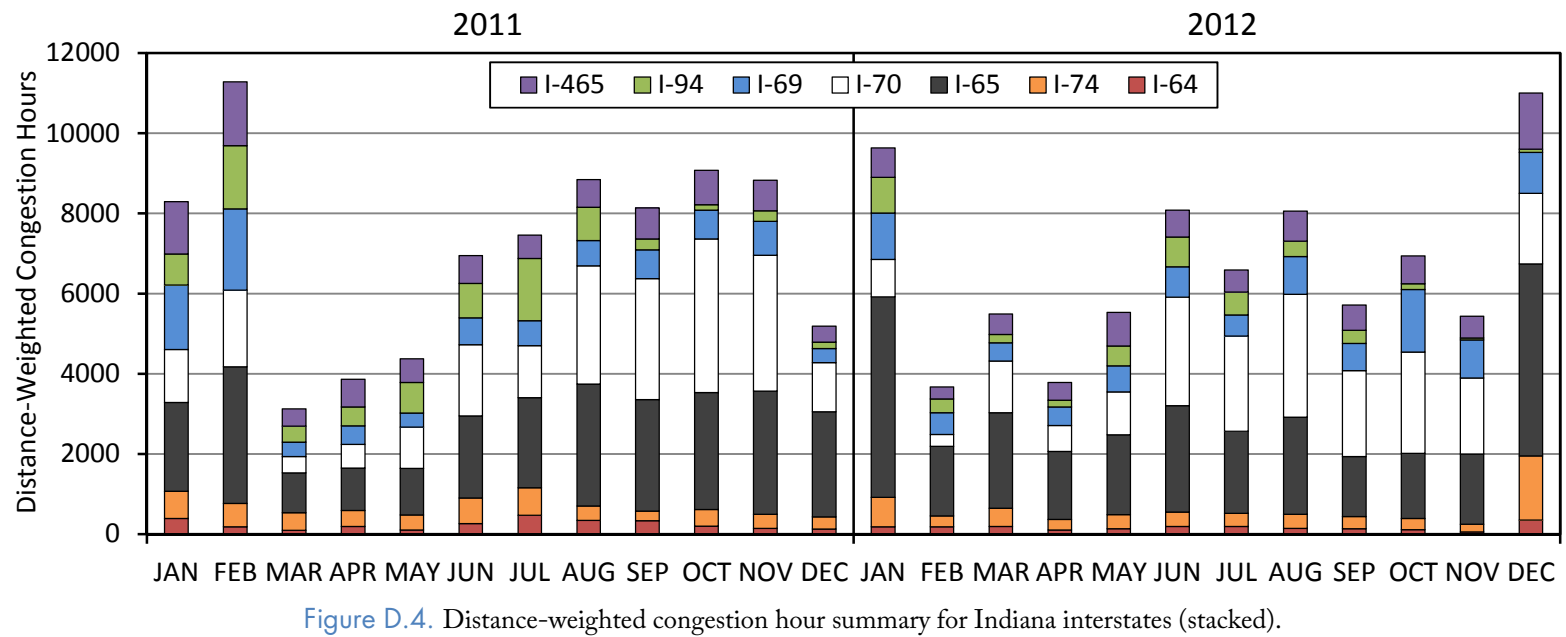
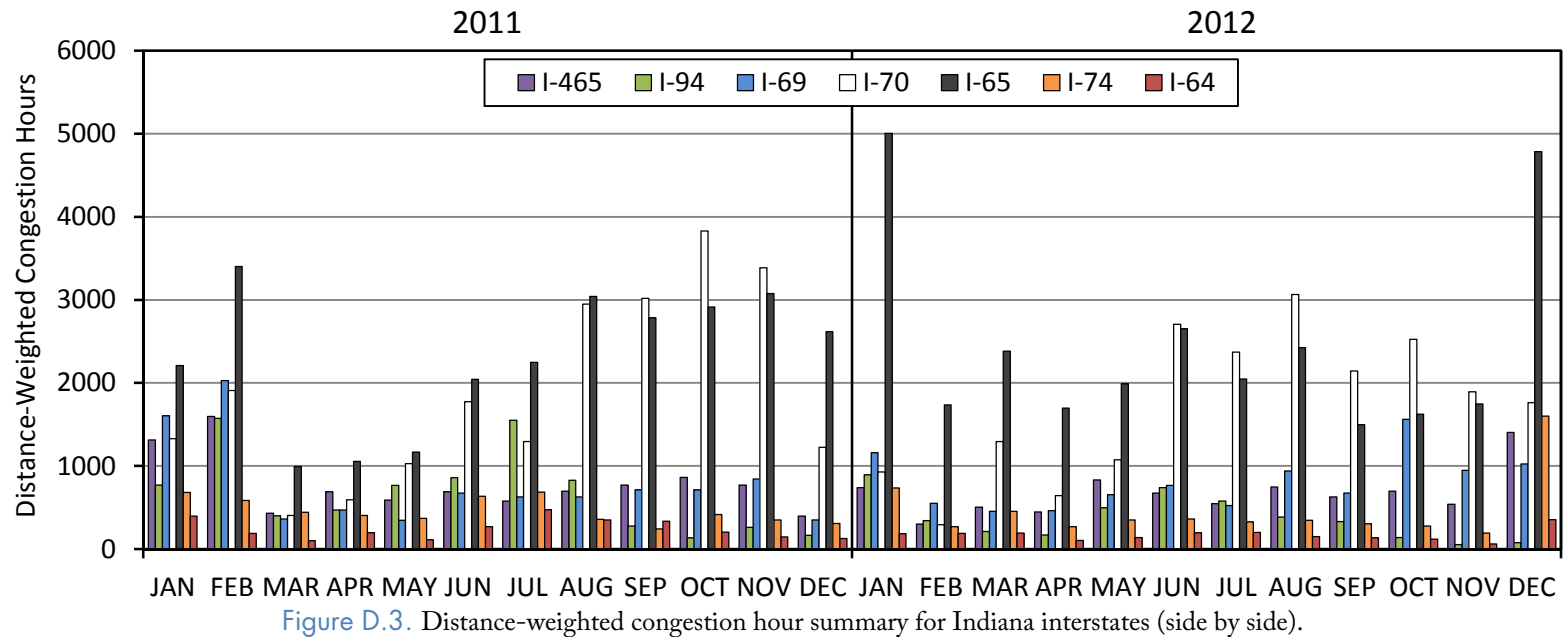


Figure D.2. Congestion hour summary for Indiana interstates (stacked).





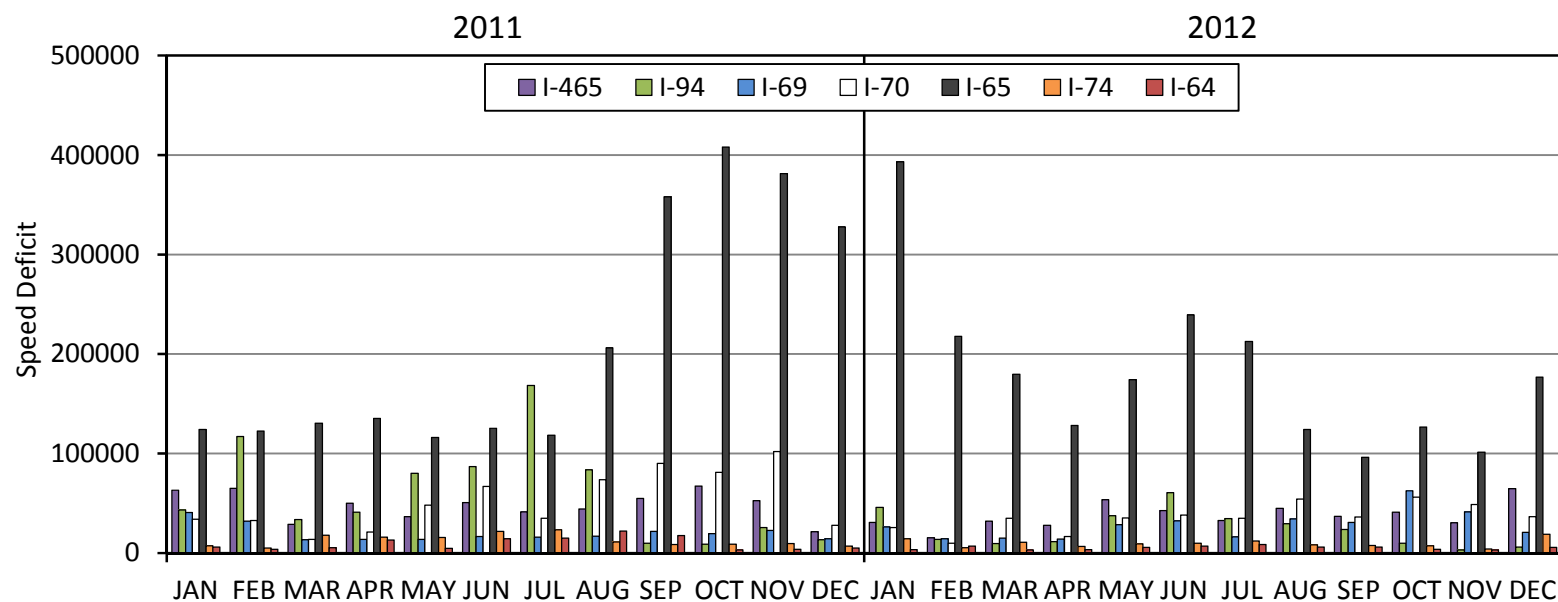


Figure D.5. Speed deficit summary for Indiana interstates (side by side).

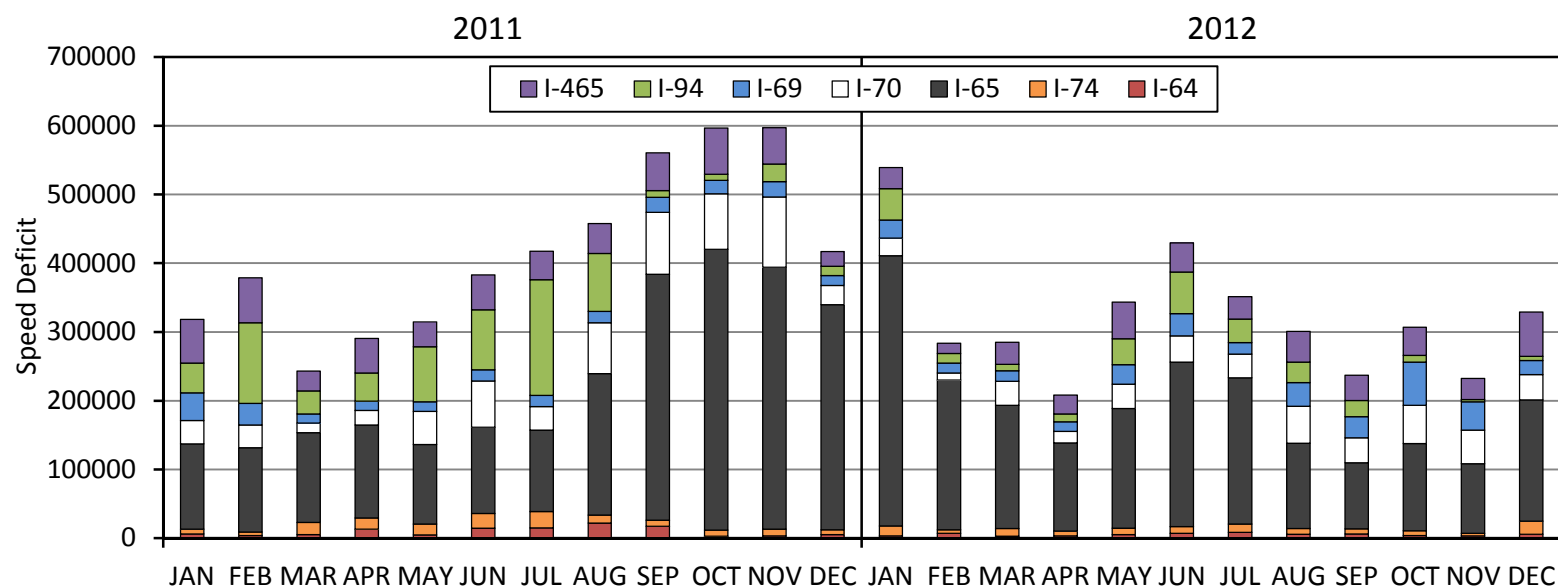


Figure D.6. Speed deficit summary for Indiana interstates (stacked).

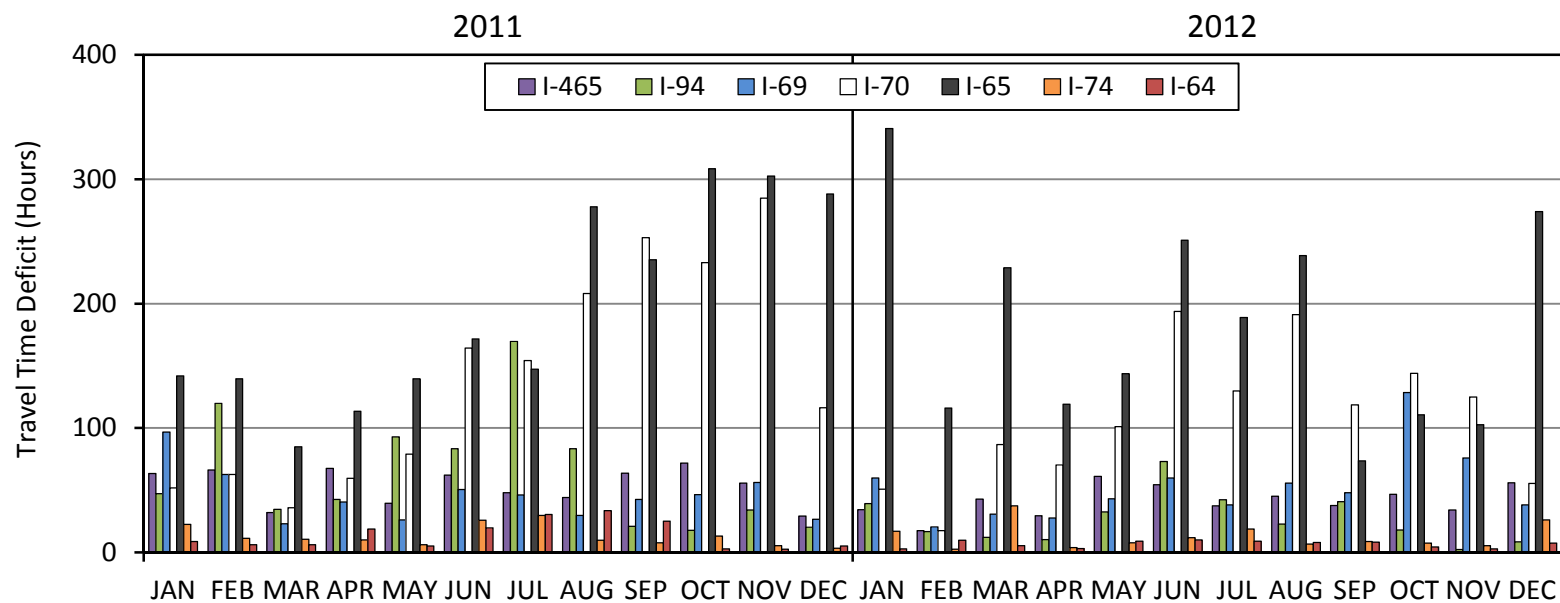


Figure D.7. Travel time deficit summary for Indiana interstates (side by side).

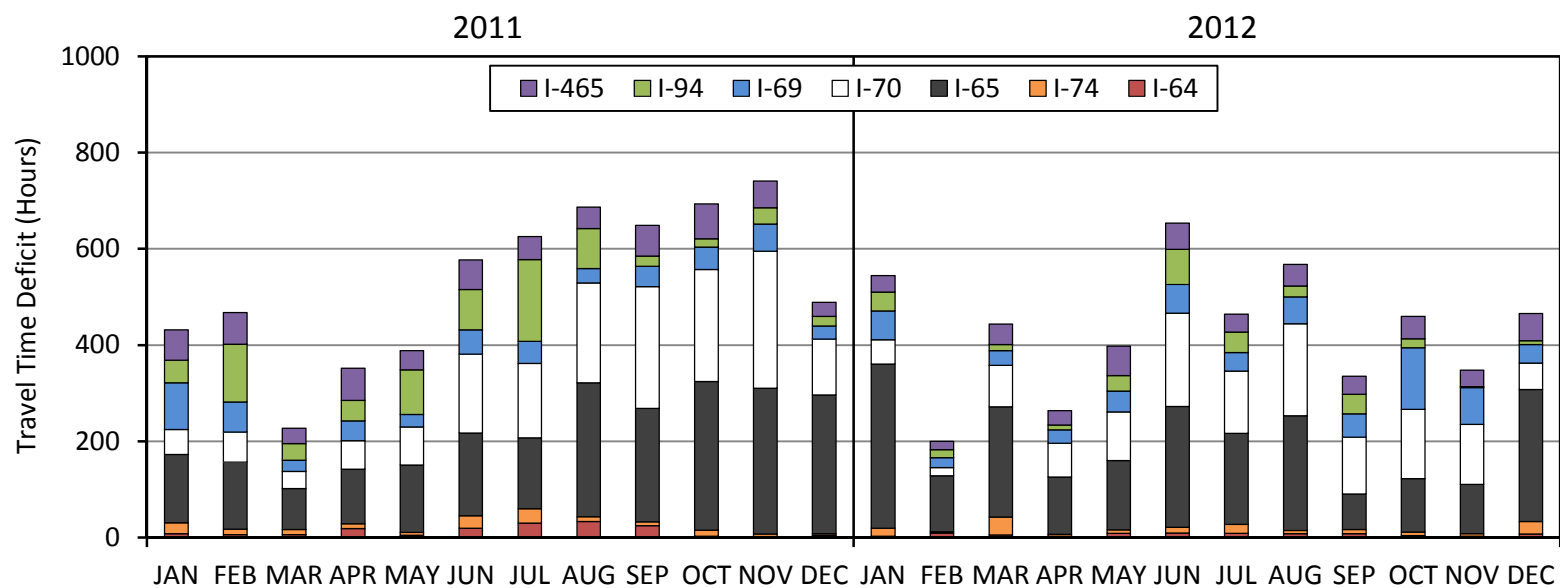


Figure D.8. Travel time deficit summary for Indiana interstates (stacked).



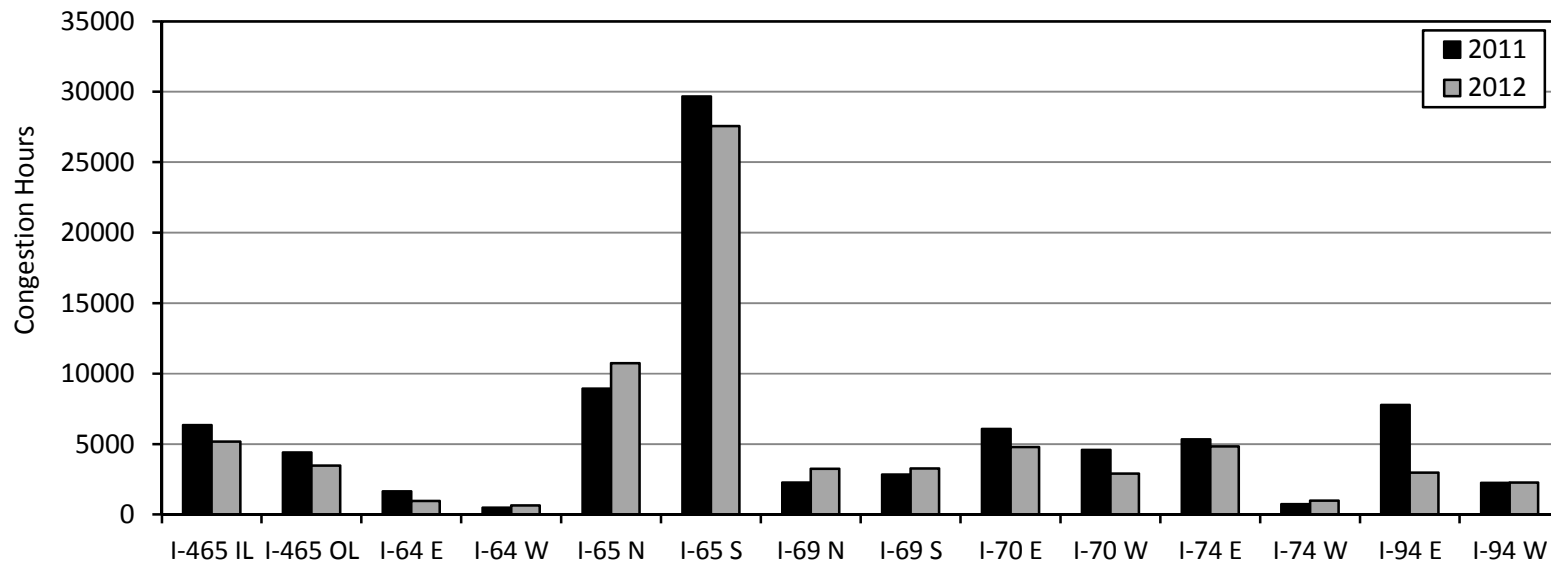


Figure D.9. Congestion hours comparison between 2011 and 2012 for Indiana interstates.

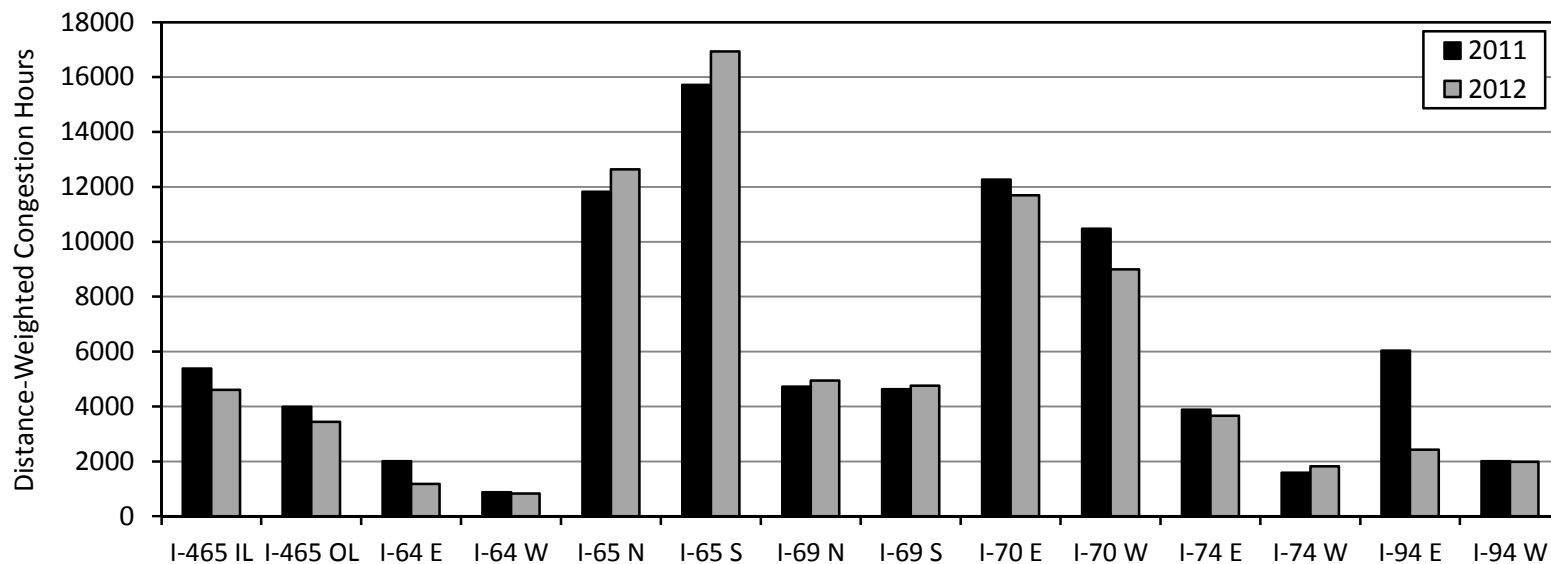


Figure D.10. Distance-weighted congestion hours comparison between 2011 and 2012 for Indiana interstates.

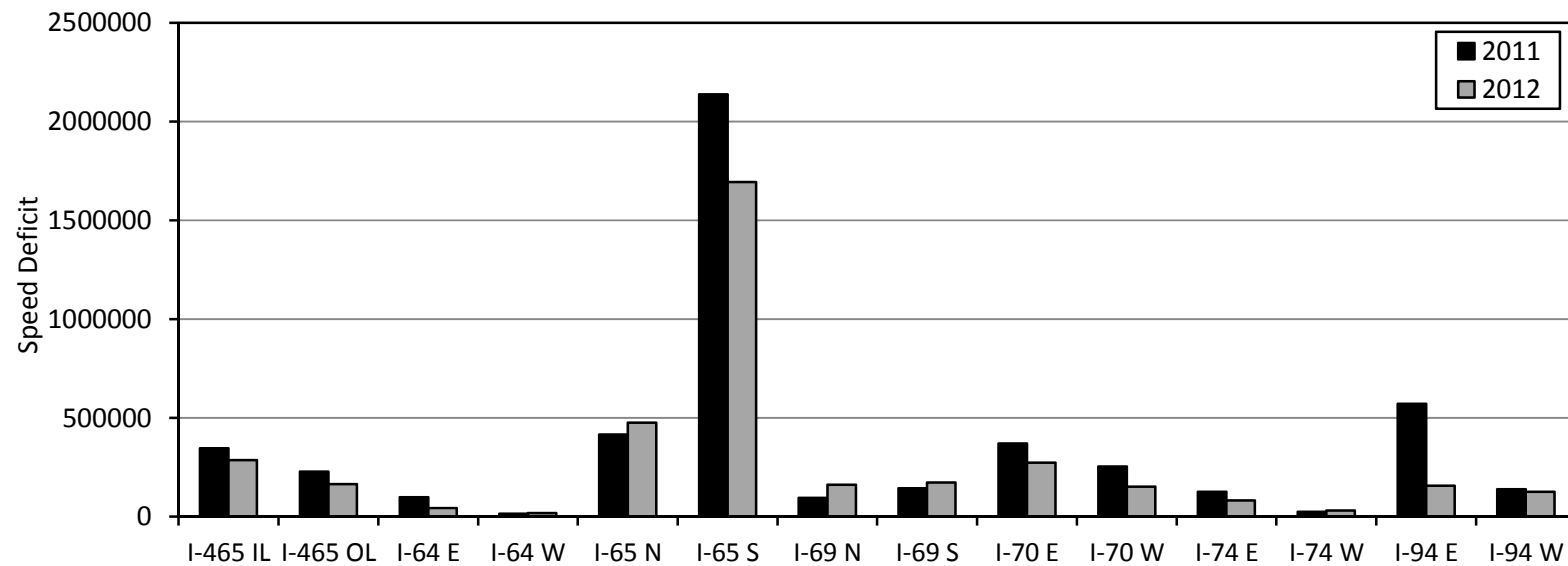


Figure D.11. Speed deficit comparison between 2011 and 2012 for Indiana interstates.

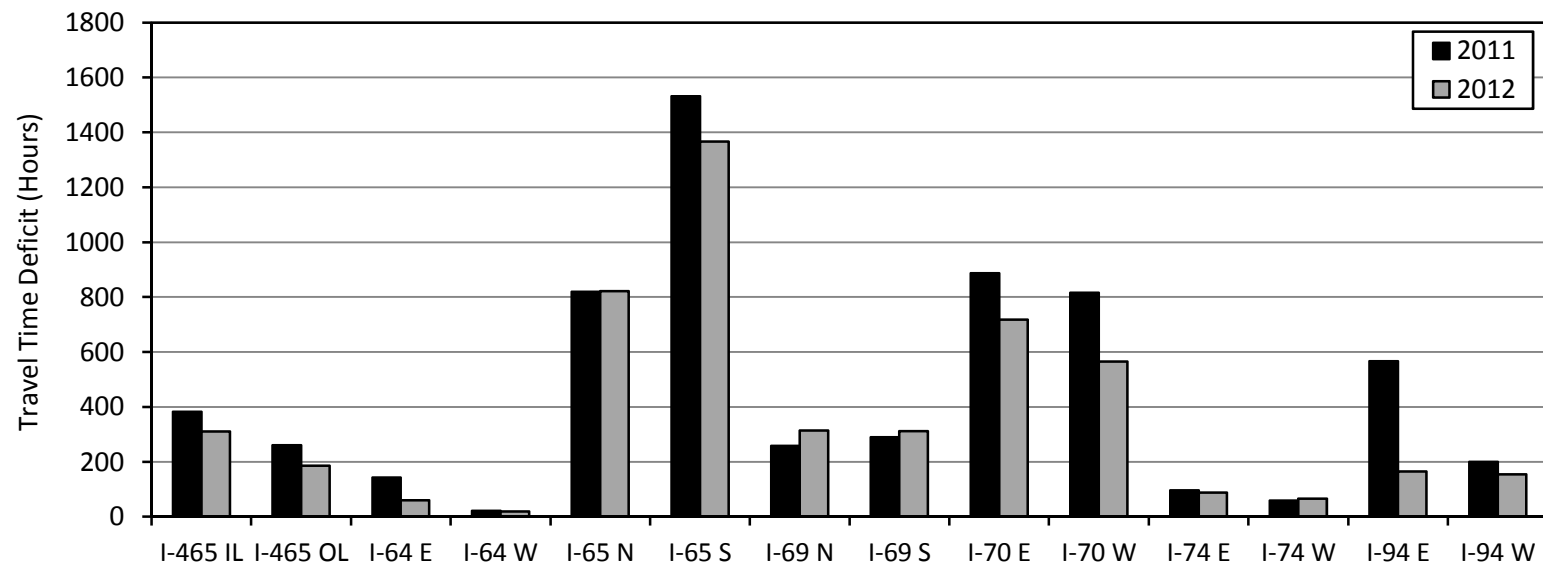


Figure D.12. Travel time deficit comparison between 2011 and 2012 for Indiana interstates.

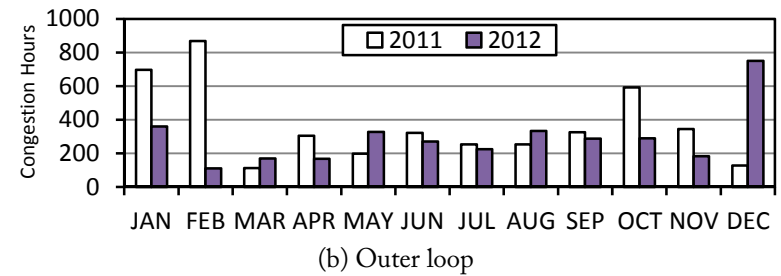
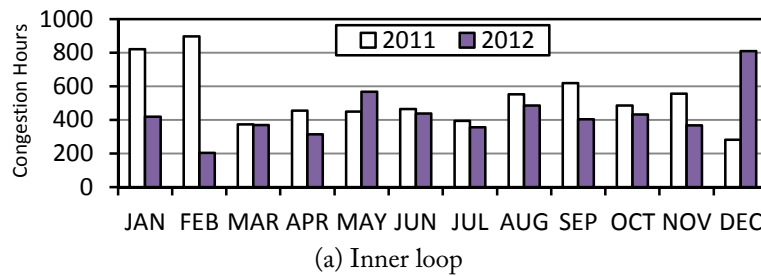


Figure D.13. Congestion hour yearly comparison, I-465.

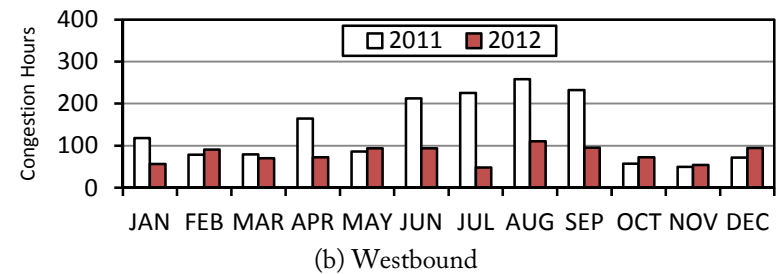
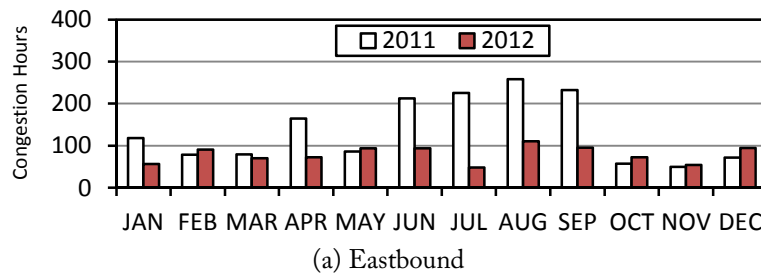


Figure D.14. Congestion hour yearly comparison, I-64.

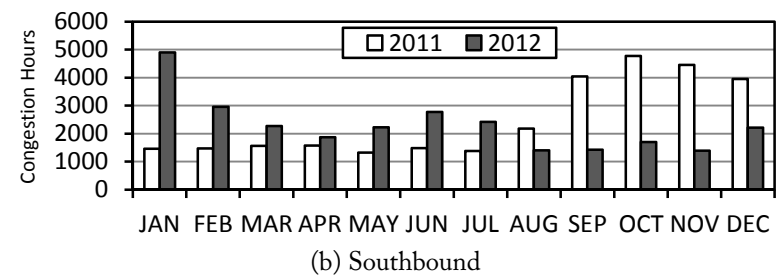
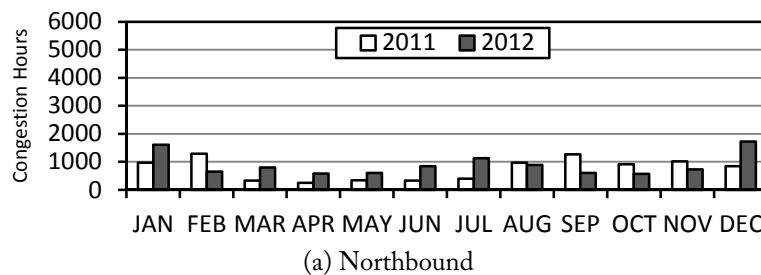


Figure D.15. Congestion hour yearly comparison, I-65.

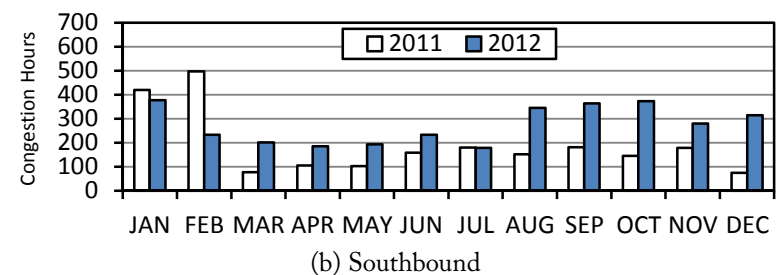
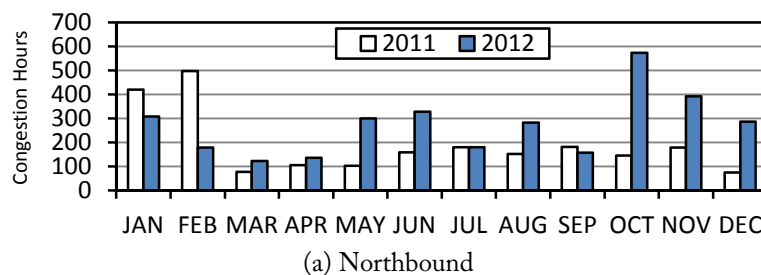


Figure D.16. Congestion hour yearly comparison, I-69.



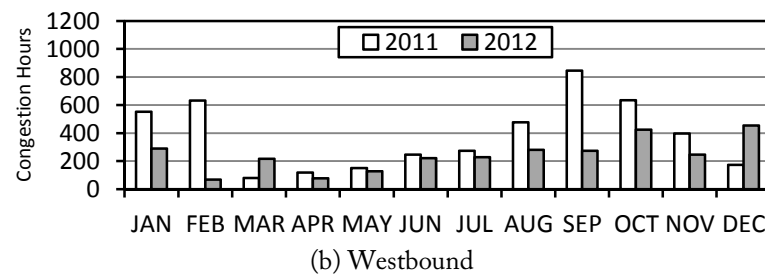
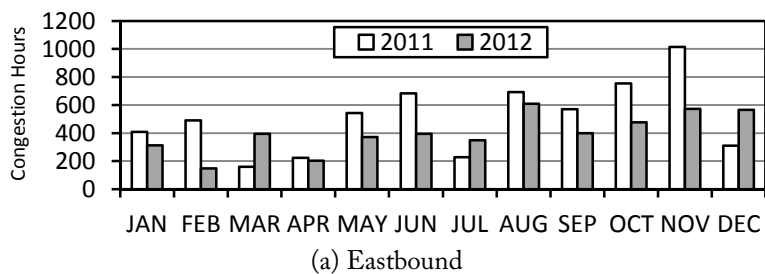


Figure D.17. Congestion hour yearly comparison, I-70.

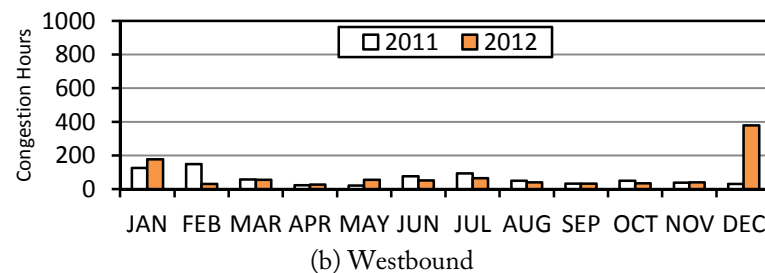
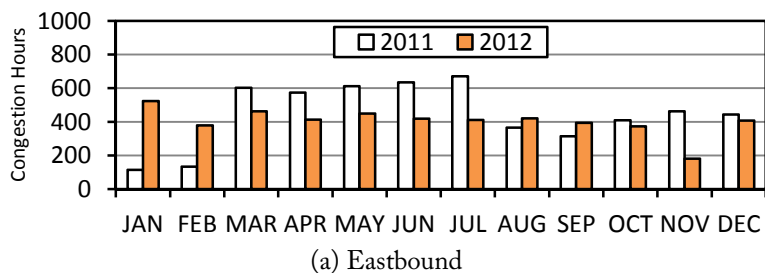


Figure D.18. Congestion hour yearly comparison, I-74.

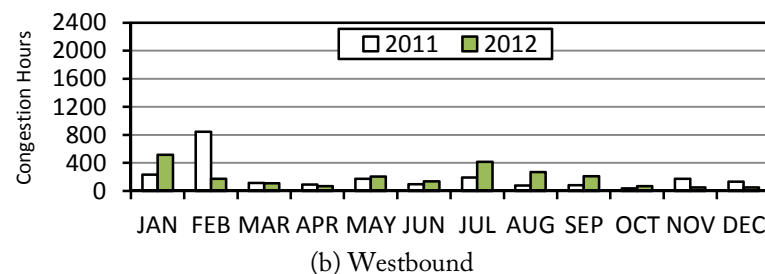
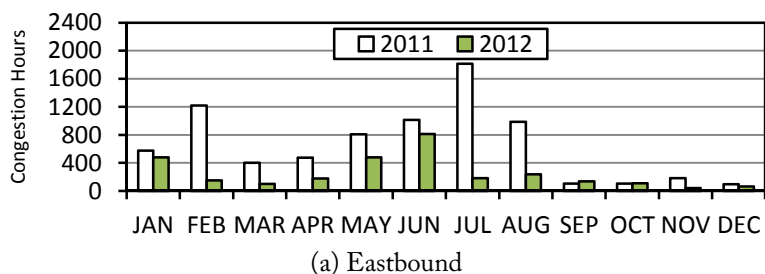
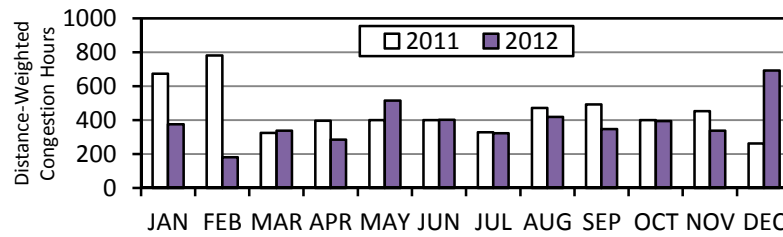
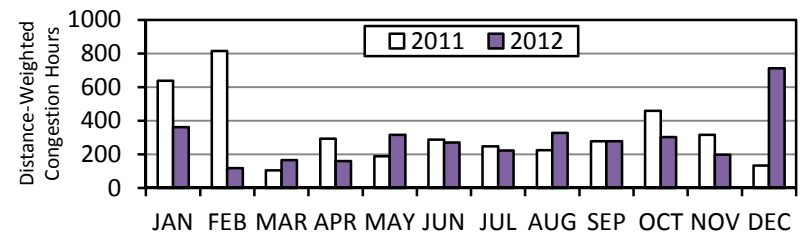


Figure D.19. Congestion hour yearly comparison, I-94.

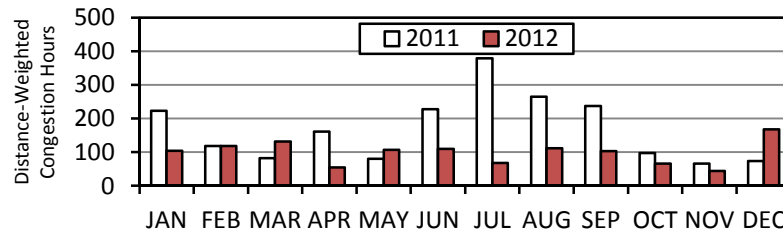


(a) Inner loop

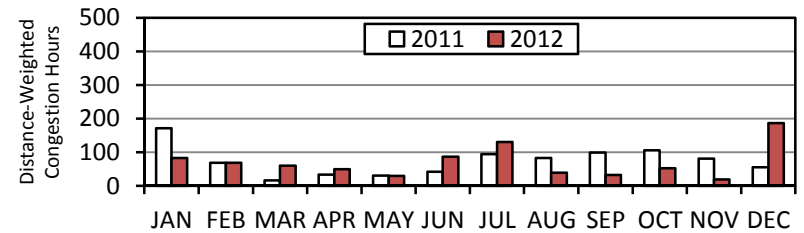


(b) Outer loop

Figure D.20. Distance-weighted congestion hour yearly comparison, I-465.

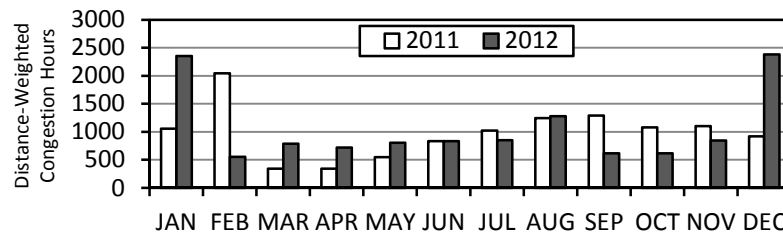


(a) Eastbound

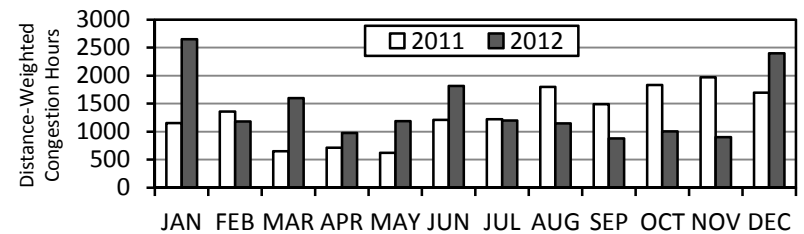


(b) Westbound

Figure D.21. Distance-weighted congestion hour yearly comparison, I-64.

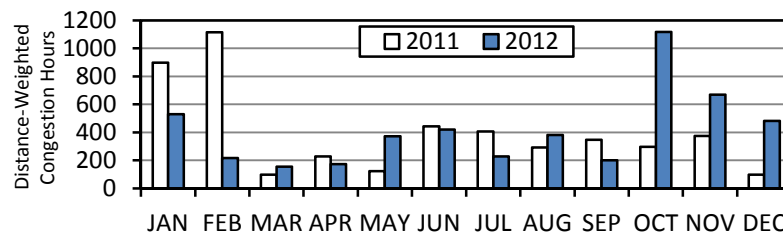


(a) Northbound

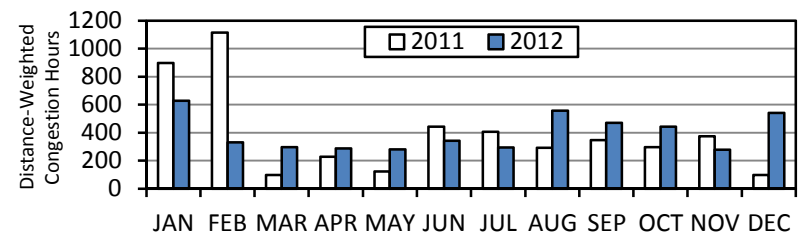


(b) Southbound

Figure D.22. Distance-weighted congestion hour yearly comparison, I-65.



(a) Northbound



(b) Southbound

Figure D.23. Distance-weighted congestion hour yearly comparison, I-69.

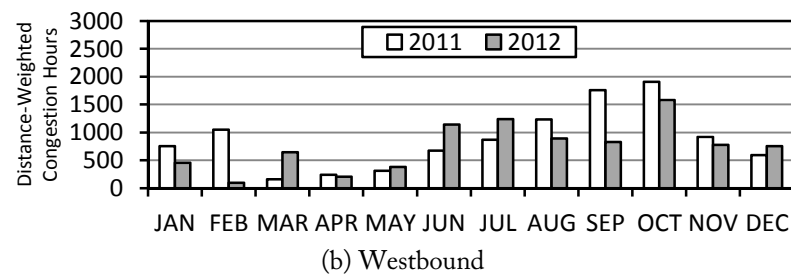
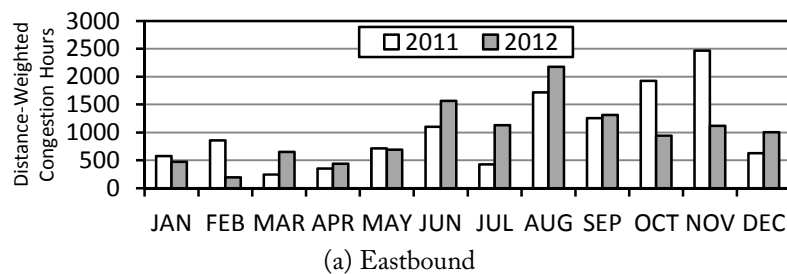


Figure D.24. Distance-weighted congestion hour yearly comparison, I-70.

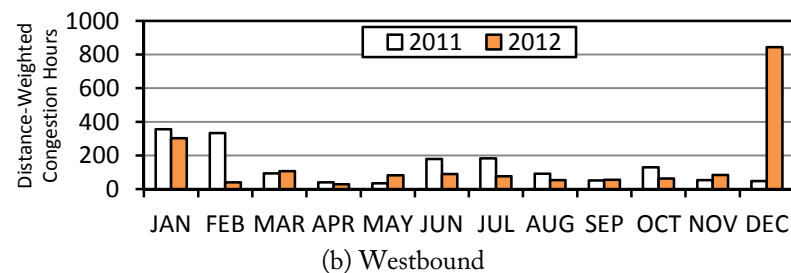
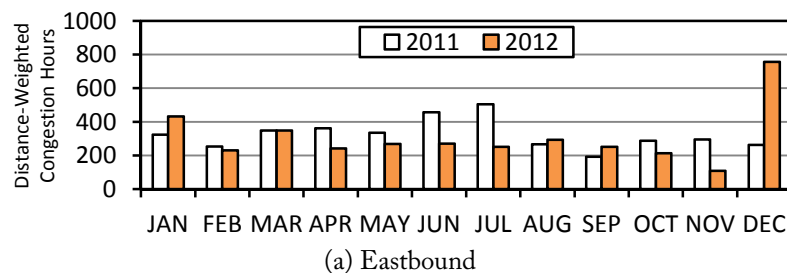


Figure D.25. Distance-weighted congestion hour yearly comparison, I-74.

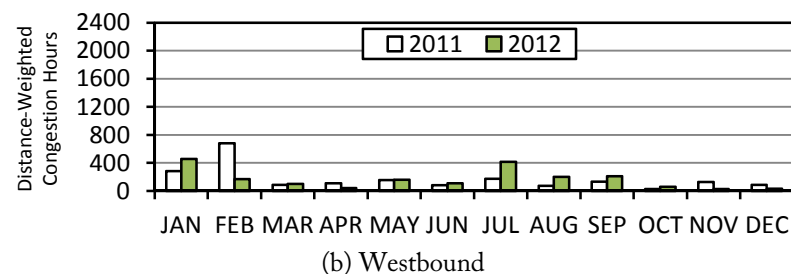
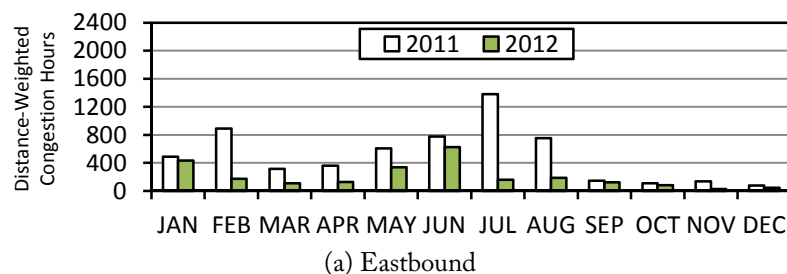
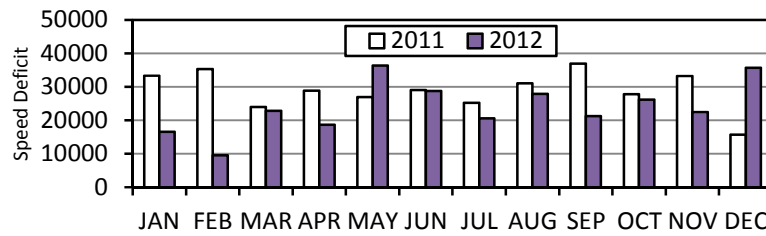
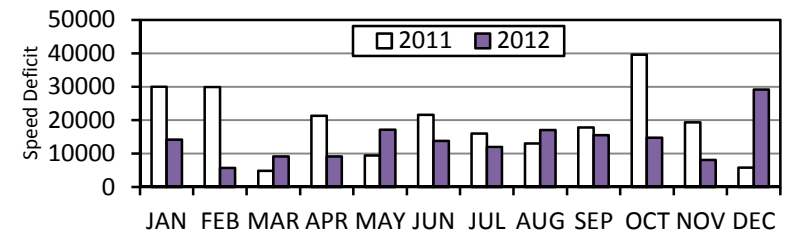


Figure D.26. Distance-weighted congestion hour yearly comparison, I-94.



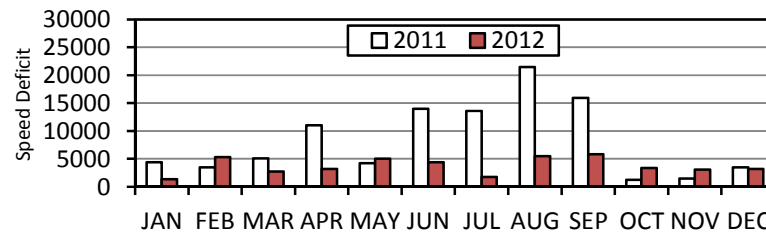


(a) Inner loop

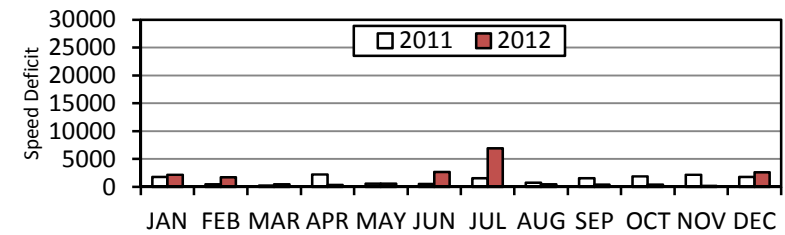


(b) Outer loop

Figure D.27. Speed deficit yearly comparison, I-465.

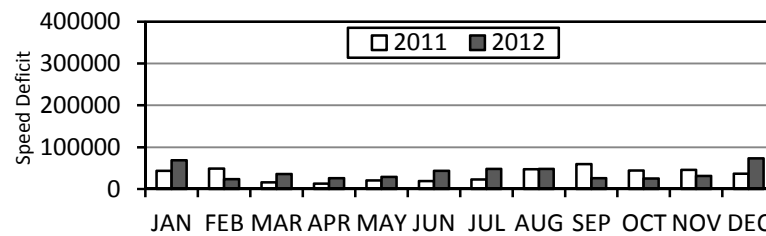


(a) Eastbound

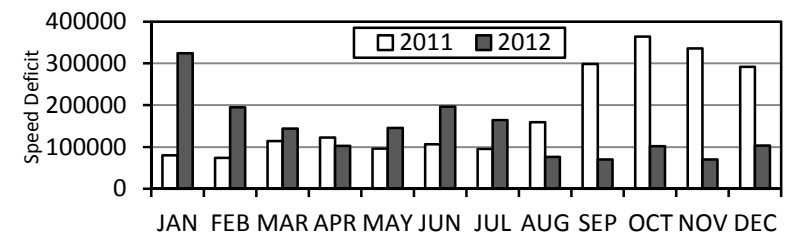


(b) Westbound

Figure D.28. Speed deficit yearly comparison, I-64.

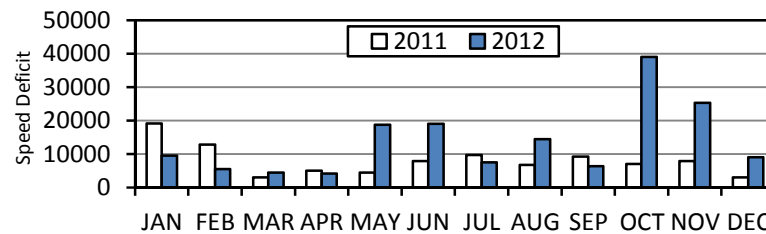


(a) Northbound

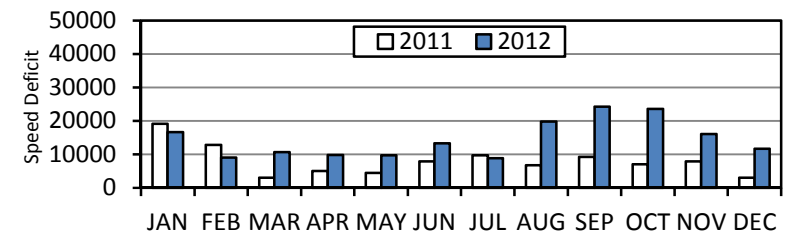


(b) Southbound

Figure D.29. Speed deficit yearly comparison, I-65.

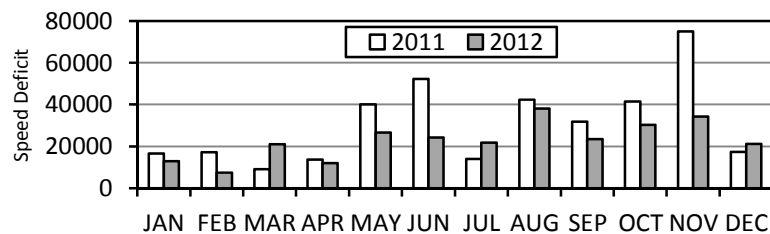


(a) Northbound

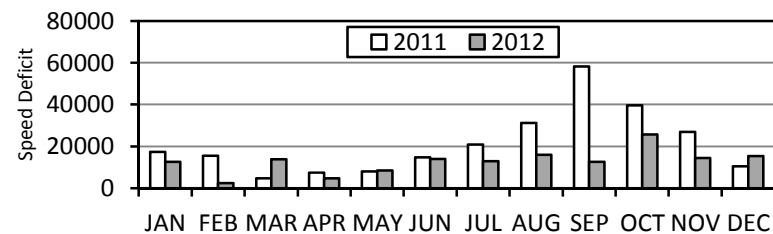


(b) Southbound

Figure D.30. Speed deficit yearly comparison, I-69.

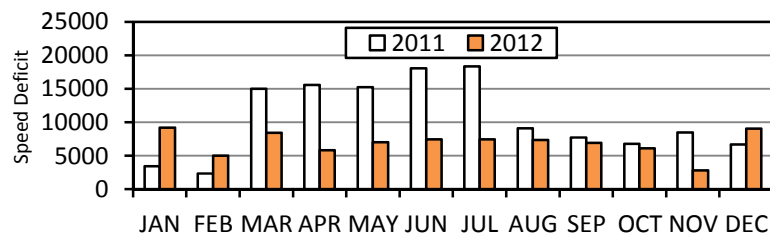


(a) Eastbound

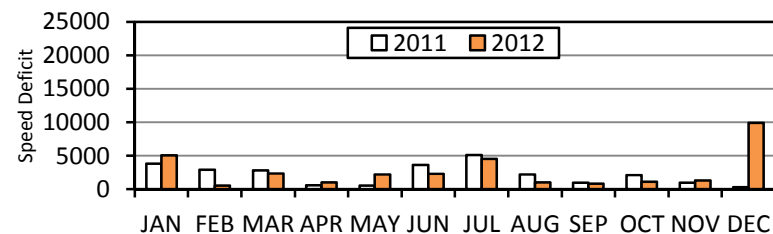


(b) Westbound

Figure D.31. Speed deficit yearly comparison, I-70.

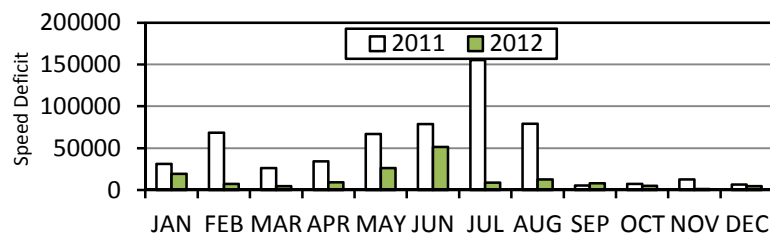


(a) Eastbound

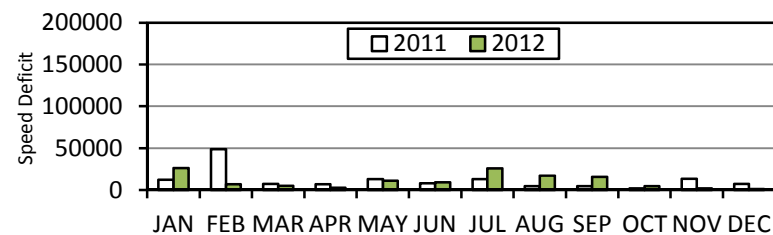


(b) Westbound

Figure D.32. Speed deficit yearly comparison, I-74.

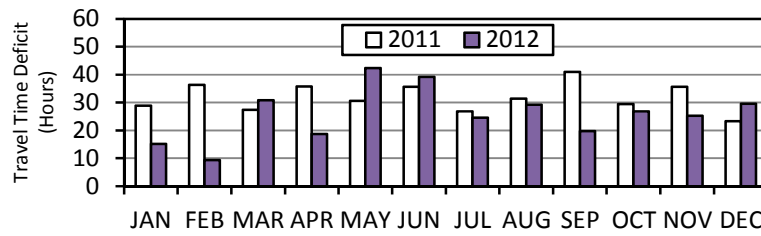


(a) Eastbound

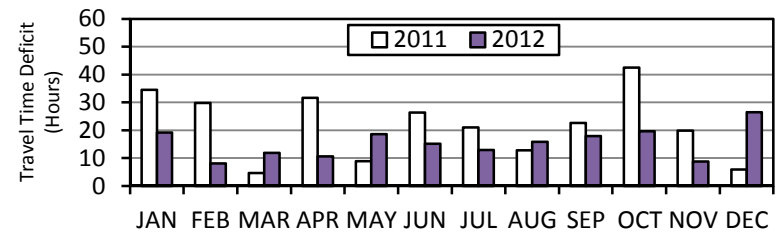


(b) Westbound

Figure D.33. Speed deficit yearly comparison, I-94.

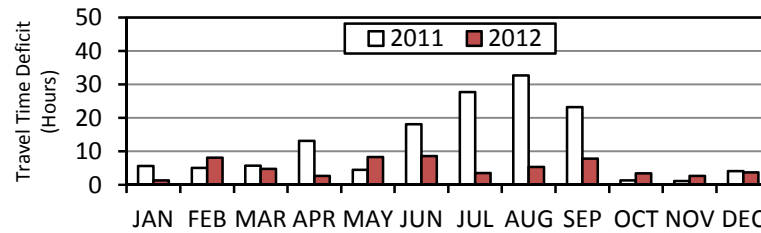


(a) Inner loop

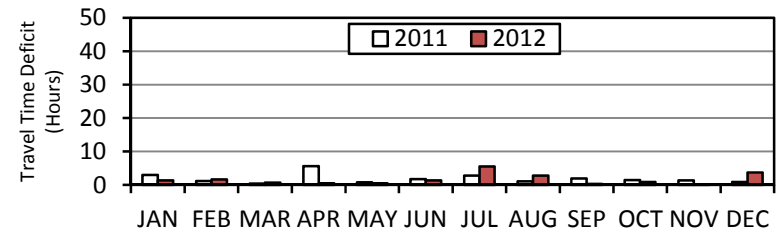


(b) Outer loop

Figure D.34. Travel time deficit yearly comparison, I-465.

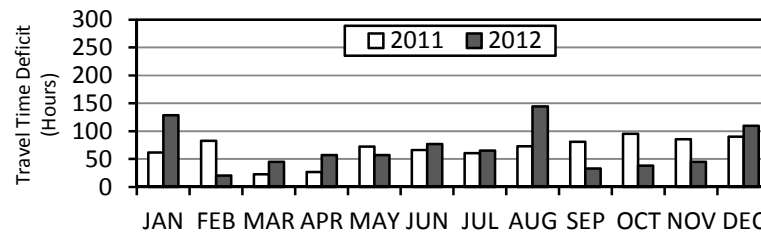


(a) Eastbound

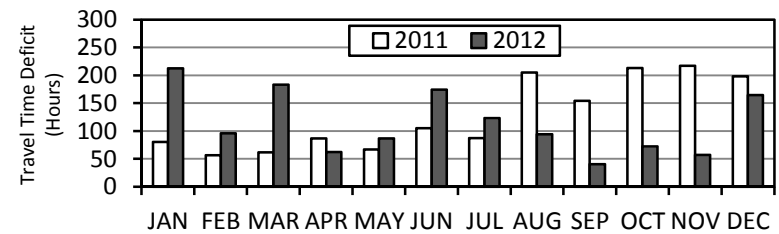


(b) Westbound

Figure D.35. Travel time deficit yearly comparison, I-64.

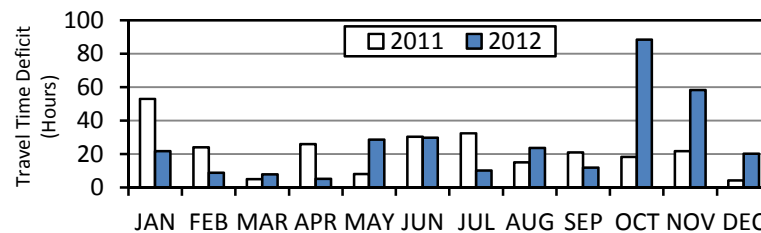


(a) Northbound

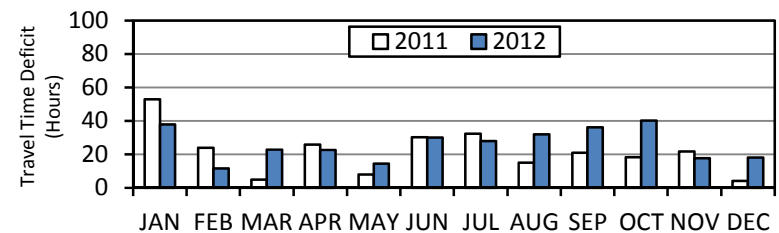


(b) Southbound

Figure D.36. Travel time deficit yearly comparison, I-65.



(a) Northbound



(b) Southbound

Figure D.37. Travel time deficit yearly comparison, I-69.



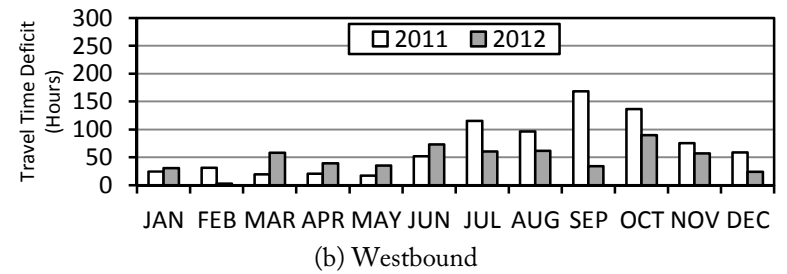
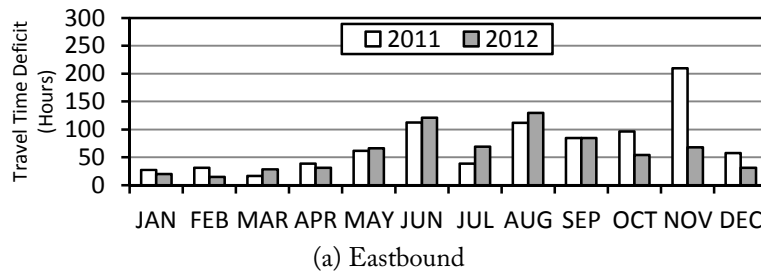


Figure D.38. Travel time deficit yearly comparison, I-70.

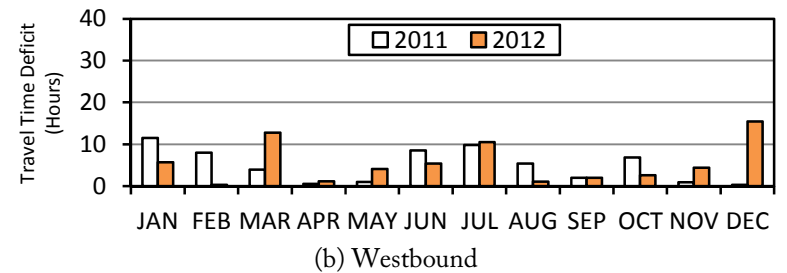
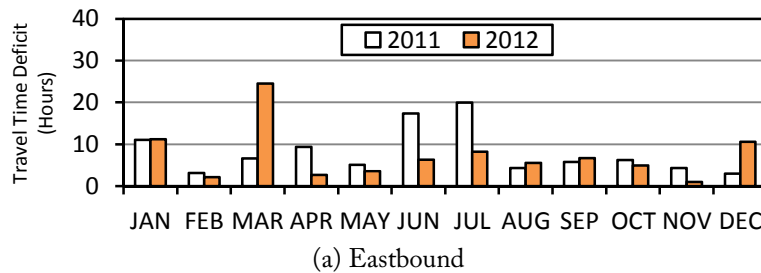


Figure D.39. Travel time deficit yearly comparison, I-74.

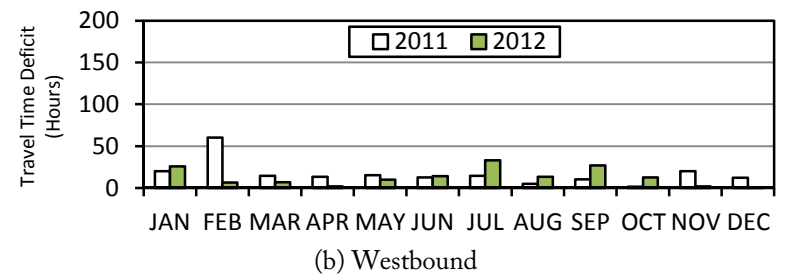
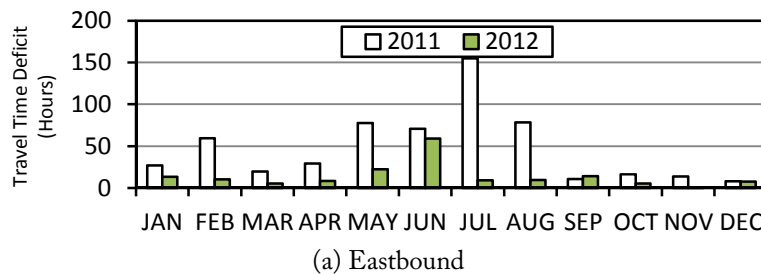
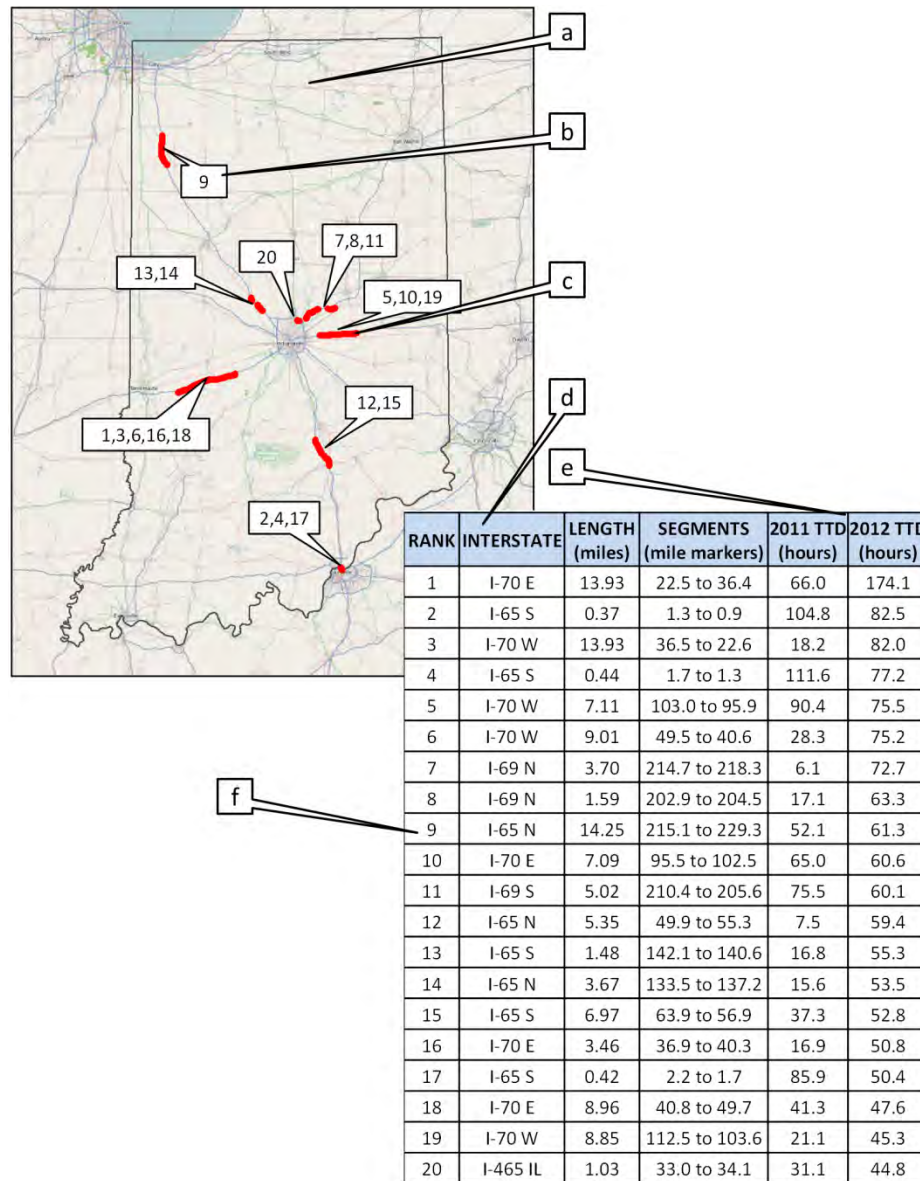


Figure D.40. Travel time deficit yearly comparison, I-94.

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# Appendix E: Interstate Segment Congestion Rankings



**Summary:** In this section, the most congested corridors in the Indiana interstate highway system are identified using four different performance measures (congestion hours, distance-weighted congestion hours, speed deficit, and travel time deficit). The change in each of these performance measures between 2011 and 2012 is also shown, offering an opportunity to compare operations between the two years.

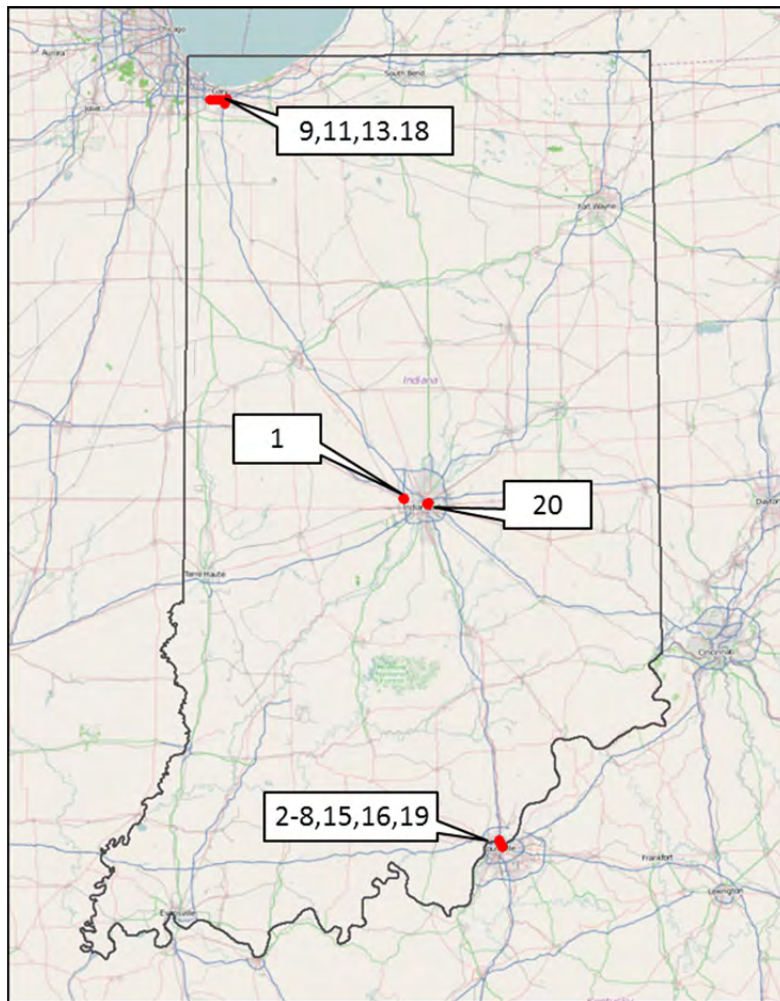
- Map of Indiana with congestion rankings
- Example ranking (9th most congested segment in Indiana according to travel time deficit in 2012)
- Example segment where three short segments make up a larger segment (this example is due to construction on I-70)
- Table showing the 20 most congested segments according to travel time deficit in 2012
- The values of travel time deficit for both 2011 and 2012
- The 9th most congested segment (corresponds to callout "b")



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## Table of Figures

<b>Interstate Segment Ranking</b>	<b>Page Number</b>
By congestion hours	160
By weighted congestion hours	164
By speed deficit	168
By travel time deficit	172



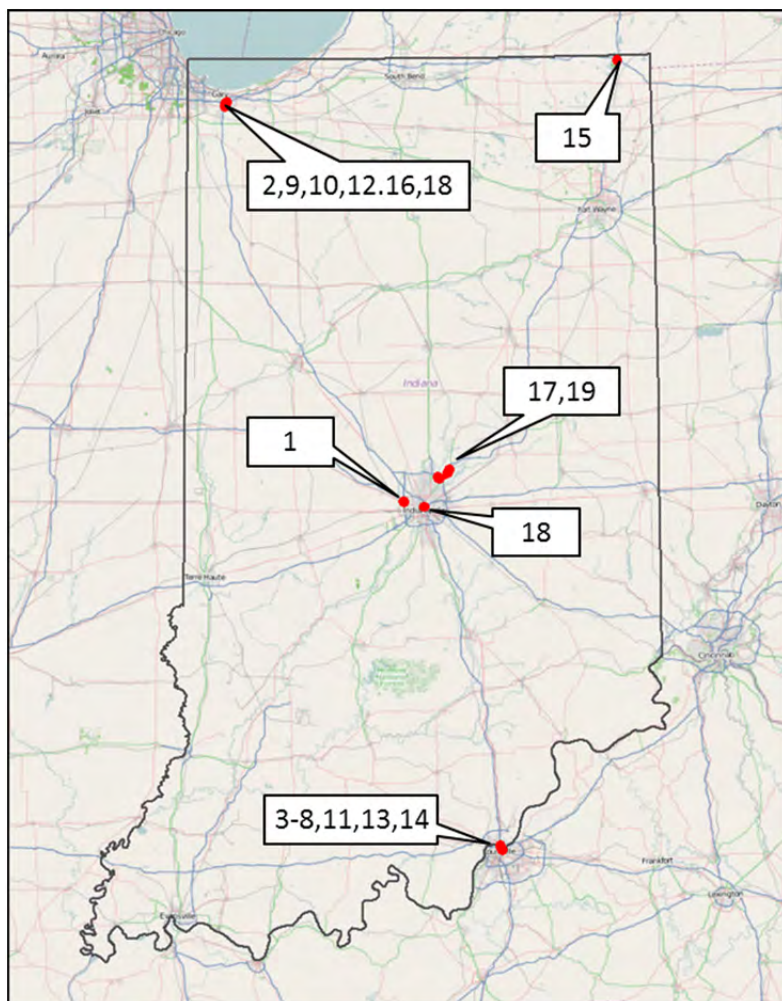
(a) Map

RANK	INTERSTATE	LENGTH (miles)	SEGMENTS (mile markers)	2011 CH (hours)	2012 CH (hours)
1	I-74 E	0.52	72.0 to 72.5	4756.3	4028.3
2	I-65 S	0.12	0.5 to 0.4	2292.5	1902.3
3	I-65 S	0.15	0.6 to 0.5	2140.5	1704.0
4	I-65 S	0.07	0.7 to 0.6	2119.8	1694.0
5	I-65 S	0.15	0.9 to 0.8	2112.3	1646.3
6	I-65 S	0.42	0.4 to 0.0	2104.8	1902.0
7	I-65 S	0.02	0.8 to 0.7	2082.8	1707.0
8	I-65 S	0.37	1.3 to 0.9	1814.8	1326.5
9	I-94 E	0.73	9.8 to 10.5	1234.0	278.5
10	I-65 S	0.44	1.7 to 1.3	1205.8	780.3
11	I-94 E	0.28	9.5 to 9.8	1170.8	289.0
12	I-65 S	0.77	260.4 to 259.7	1067.5	2191.5
13	I-94 E	0.74	8.7 to 9.5	1059.8	227.3
14	I-65 N	0.81	259.4 to 260.2	1006.5	1355.5
15	I-65 S	0.01	1.7 to 1.7	997.0	597.8
16	I-65 S	0.42	2.2 to 1.7	838.3	474.0
17	I-65 N	1.07	258.4 to 259.4	815.0	1194.0
18	I-94 E	1.80	6.9 to 8.7	753.0	140.3
19	I-65 S	0.30	2.5 to 2.2	613.5	308.5
20	I-70 W	1.00	83.1 to 82.1	602.3	198.5

(b) Table

Figure E.1. Top 20 congestion hour (CH) segments throughout the Indiana interstate system, 2011.



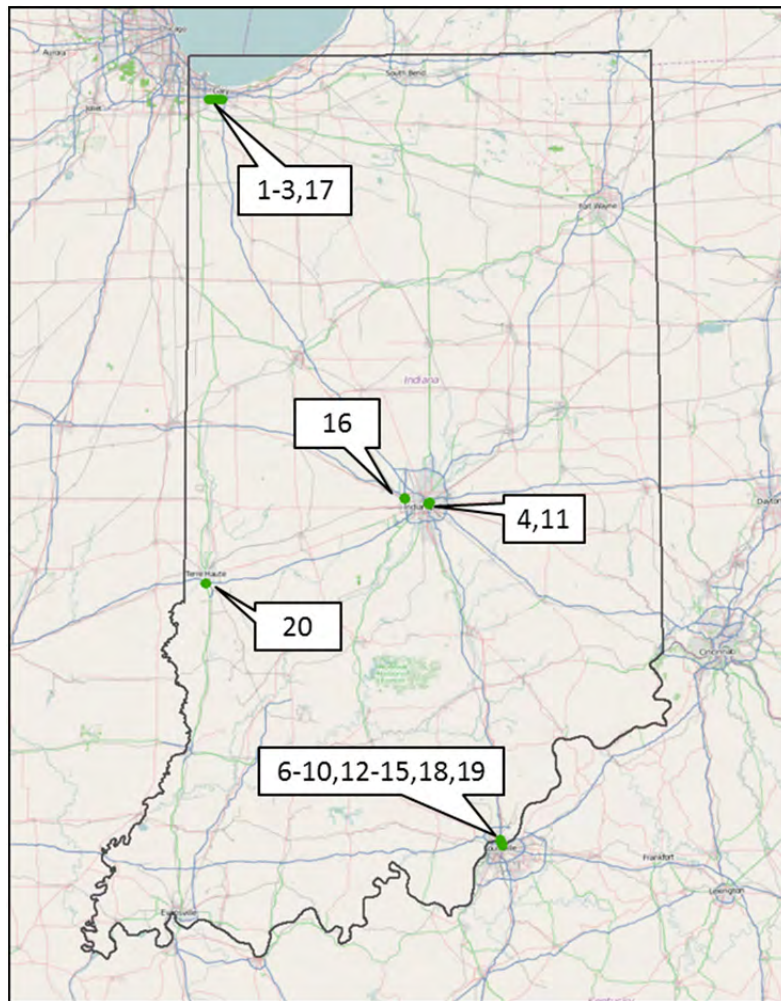


(a) Map

RANK	INTERSTATE	LENGTH (miles)	SEGMENTS (mile markers)	2011 CH (hours)	2012 CH (hours)
1	I-74 E	0.52	72.0 to 72.5	4756.3	4028.3
2	I-65 S	0.77	260.4 to 259.7	1067.5	2191.5
3	I-65 S	0.12	0.5 to 0.4	2292.5	1902.3
4	I-65 S	0.42	0.4 to 0.0	2104.8	1902.0
5	I-65 S	0.02	0.8 to 0.7	2082.8	1707.0
6	I-65 S	0.15	0.6 to 0.5	2140.5	1704.0
7	I-65 S	0.07	0.7 to 0.6	2119.8	1694.0
8	I-65 S	0.15	0.9 to 0.8	2112.3	1646.3
9	I-65 S	1.10	259.7 to 258.6	331.3	1436.3
10	I-65 N	0.81	259.4 to 260.2	1006.5	1355.5
11	I-65 S	0.37	1.3 to 0.9	1814.8	1326.5
12	I-65 N	1.07	258.4 to 259.4	815.0	1194.0
13	I-65 S	0.44	1.7 to 1.3	1205.8	780.3
14	I-65 S	0.01	1.7 to 1.7	997.0	597.8
15	I-69 N	0.54	356.0 to 356.6	242.3	579.8
16	I-65 S	0.28	258.6 to 258.3	190.5	573.3
17	I-69 N	1.59	202.9 to 204.5	283.0	555.0
18	I-65 S	0.22	113.8 to 113.6	574.0	538.5
19	I-69 S	0.60	202.9 to 202.3	457.5	538.3
20	I-465 IL	0.84	34.1 to 34.9	579.5	524.3

(b) Table

Figure E.2. Top 20 congestion hour (CH) segments throughout the Indiana interstate system, 2012.

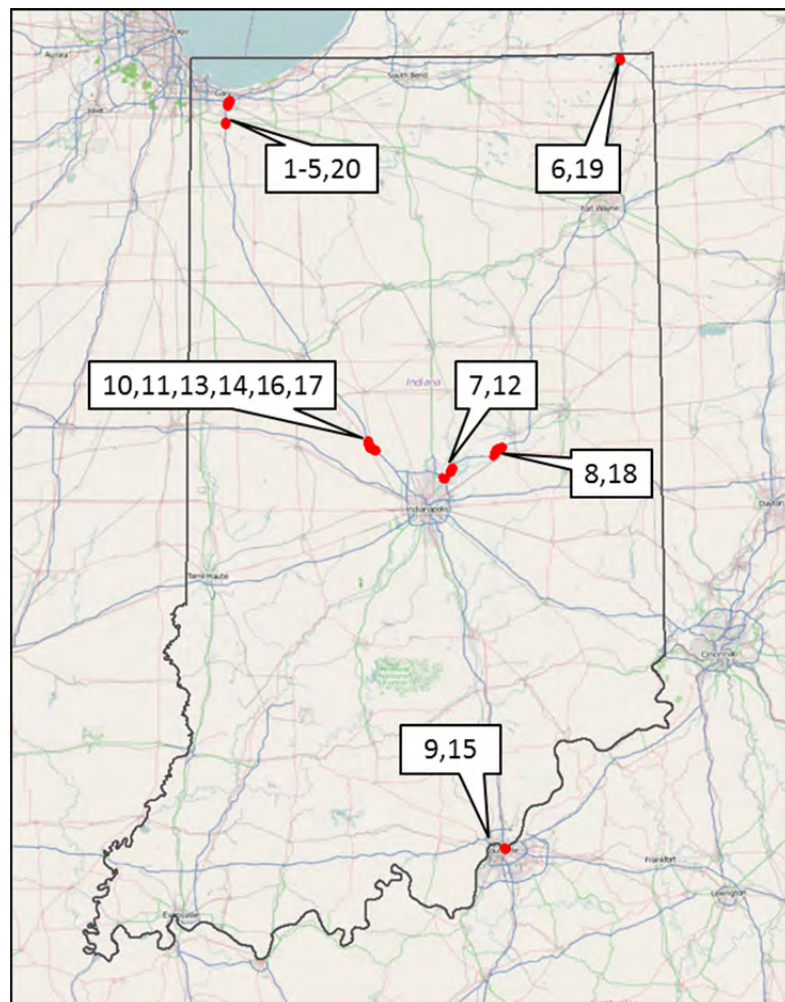


(a) Map

RANK	INTERSTATE	LENGTH (miles)	SEGMENTS (mile markers)	2011 CH (hours)	2012 CH (hours)	Difference (2011-2012)
1	I-94 E	0.73	9.8 to 10.5	1234.0	278.5	955.5
2	I-94 E	0.28	9.5 to 9.8	1170.8	289.0	881.8
3	I-94 E	0.74	8.7 to 9.5	1059.8	227.3	832.5
4	I-74 E	0.52	72.0 to 72.5	4756.3	4028.3	728.0
5	I-94 E	1.80	6.9 to 8.7	753.0	140.3	612.8
6	I-65 S	0.37	1.3 to 0.9	1814.8	1326.5	488.3
7	I-65 S	0.15	0.9 to 0.8	2112.3	1646.3	466.0
8	I-65 S	0.15	0.6 to 0.5	2140.5	1704.0	436.5
9	I-65 S	0.07	0.7 to 0.6	2119.8	1694.0	425.8
10	I-65 S	0.44	1.7 to 1.3	1205.8	780.3	425.5
11	I-70 W	1.00	83.1 to 82.1	602.3	198.5	403.8
12	I-65 S	0.01	1.7 to 1.7	997.0	597.8	399.3
13	I-65 S	0.12	0.5 to 0.4	2292.5	1902.3	390.3
14	I-65 S	0.02	0.8 to 0.7	2082.8	1707.0	375.8
15	I-65 S	0.42	2.2 to 1.7	838.3	474.0	364.3
16	I-465 IL	0.45	15.2 to 15.7	422.0	92.5	329.5
17	I-94 E	0.66	6.3 to 6.9	464.0	155.3	308.8
18	I-65 S	0.30	2.5 to 2.2	613.5	308.5	305.0
19	I-65 S	0.01	2.5 to 2.5	526.3	233.8	292.5
20	I-70 E	0.41	6.7 to 7.1	303.3	23.5	279.8

(b) Table

Figure E.3. Most improved interstate segments based on congestion hours (CH).



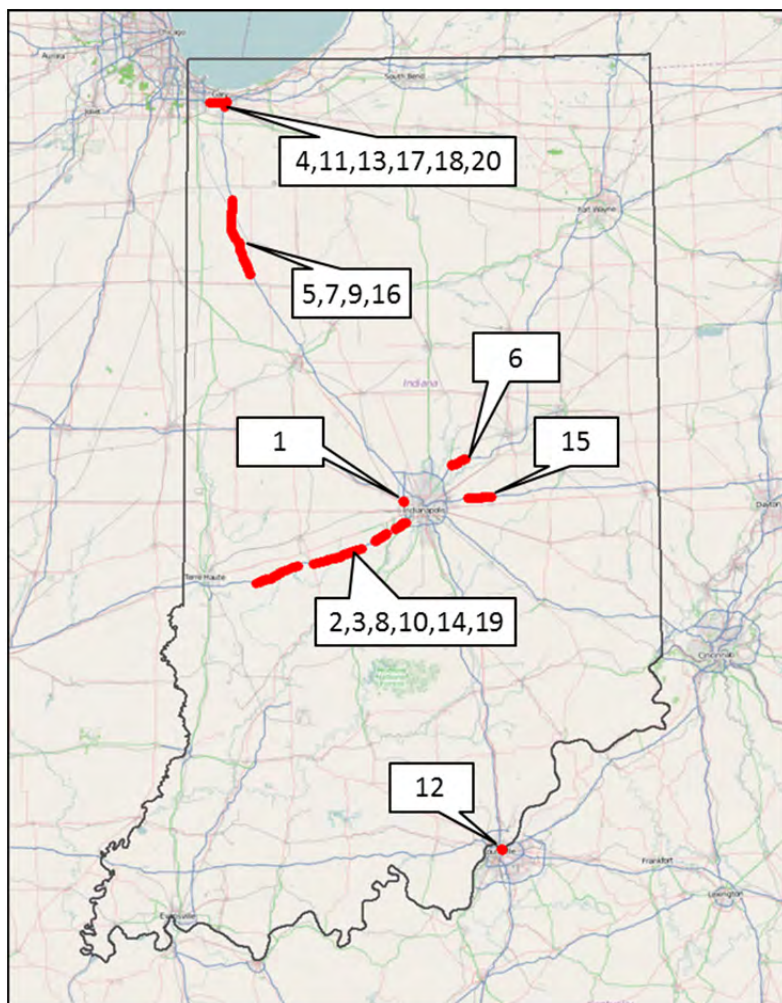
(a) Map

RANK	INTERSTATE	LENGTH (miles)	SEGMENTS (mile markers)	2011 CH (hours)	2012 CH (hours)	Difference (2011-2012)
1	I-65 S	0.77	260.4 to 259.7	1067.5	2191.5	-1124.0
2	I-65 S	1.10	259.7 to 258.6	331.3	1436.3	-1105.0
3	I-65 S	0.28	258.6 to 258.3	190.5	573.3	-382.8
4	I-65 N	1.07	258.4 to 259.4	815.0	1194.0	-379.0
5	I-65 N	0.81	259.4 to 260.2	1006.5	1355.5	-349.0
6	I-69 N	0.54	356.0 to 356.6	242.3	579.8	-337.5
7	I-69 N	1.59	202.9 to 204.5	283.0	555.0	-272.0
8	I-69 N	0.61	218.3 to 219.0	20.5	273.5	-253.0
9	I-65 N	0.33	0.0 to 0.3	271.5	519.3	-247.8
10	I-65 S	0.37	140.6 to 140.2	155.8	341.3	-185.5
11	I-65 N	0.84	137.8 to 138.7	83.0	266.8	-183.8
12	I-465 OL	0.77	36.2 to 35.4	95.8	275.0	-179.3
13	I-65 S	1.48	142.1 to 140.6	118.0	296.0	-178.0
14	I-65 N	0.35	138.7 to 139.0	103.8	272.8	-169.0
15	I-65 N	0.03	0.3 to 0.4	57.8	222.8	-165.0
16	I-65 N	0.96	139.0 to 140.0	108.0	272.0	-164.0
17	I-65 S	1.00	140.2 to 139.2	192.0	354.3	-162.3
18	I-69 N	3.15	219.0 to 222.2	35.3	186.5	-151.3
19	I-69 S	0.70	356.6 to 355.9	73.8	223.8	-150.0
20	I-65 S	0.68	253.3 to 252.6	69.3	205.5	-136.3

(b) Table

Figure E.4. Most degraded segments based on congestion hours (CH).



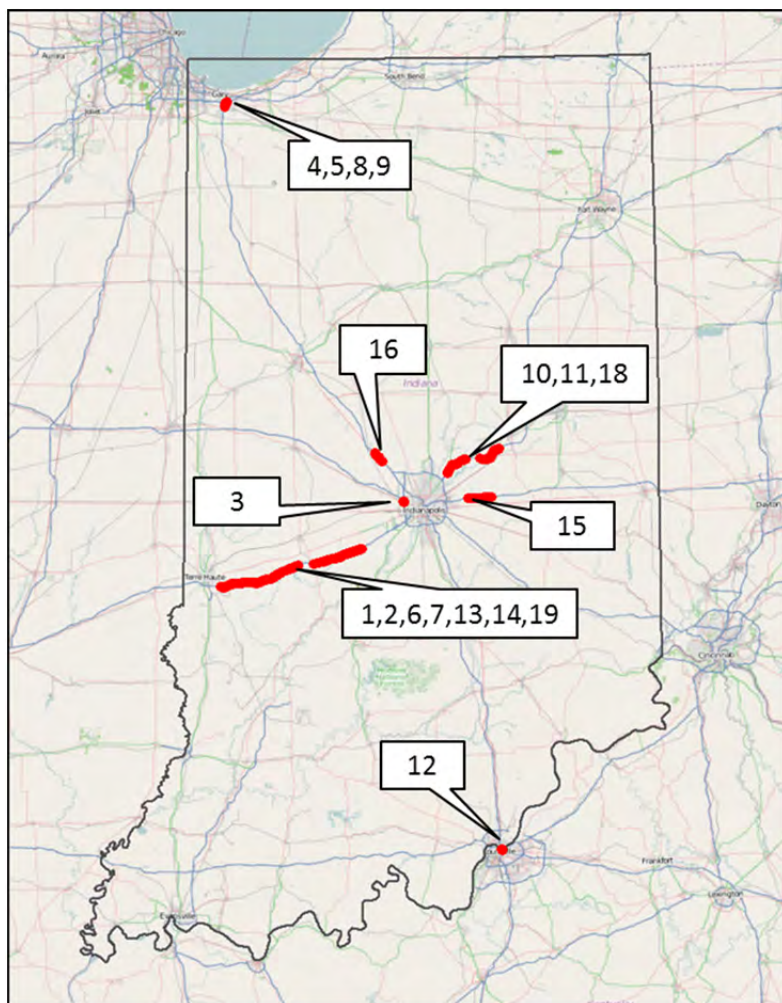


(a) Map

RANK	INTERSTATE	LENGTH (miles)	SEGMENTS (mile markers)	2011 DWCH	2012 DWCH
1	I-74 E	0.52	72.0 to 72.5	2475.0	2096.1
2	I-70 E	13.93	22.5 to 36.4	1797.5	3584.5
3	I-70 W	4.55	65.5 to 60.5	1354.0	438.1
4	I-94 E	1.80	6.9 to 8.7	1353.9	252.2
5	I-65 S	14.28	229.6 to 215.3	1114.1	471.3
6	I-69 S	5.02	210.4 to 205.6	1112.3	792.2
7	I-65 N	9.14	205.3 to 214.4	1003.3	125.7
8	I-70 E	8.96	40.8 to 49.7	985.4	1473.6
9	I-65 N	14.25	215.1 to 229.3	929.9	466.7
10	I-70 E	6.29	50.1 to 56.3	907.5	429.4
11	I-94 E	0.73	9.8 to 10.5	894.7	201.9
12	I-65 S	0.42	0.4 to 0.0	875.8	791.4
13	I-65 N	1.07	258.4 to 259.4	872.1	1277.7
14	I-70 W	4.04	72.4 to 68.4	860.1	56.5
15	I-70 W	7.11	103.0 to 95.9	849.9	581.4
16	I-65 S	9.20	214.7 to 205.5	834.8	124.2
17	I-65 S	0.77	260.4 to 259.7	821.7	1686.9
18	I-65 N	0.81	259.4 to 260.2	819.1	1103.2
19	I-70 E	4.45	60.5 to 65.5	814.6	481.2
20	I-94 E	0.74	8.7 to 9.5	785.1	168.4

(b) Table

Figure E.5. Top 20 distance-weighted congestion hour (DWCH) segments throughout the Indiana interstate system, 2011.

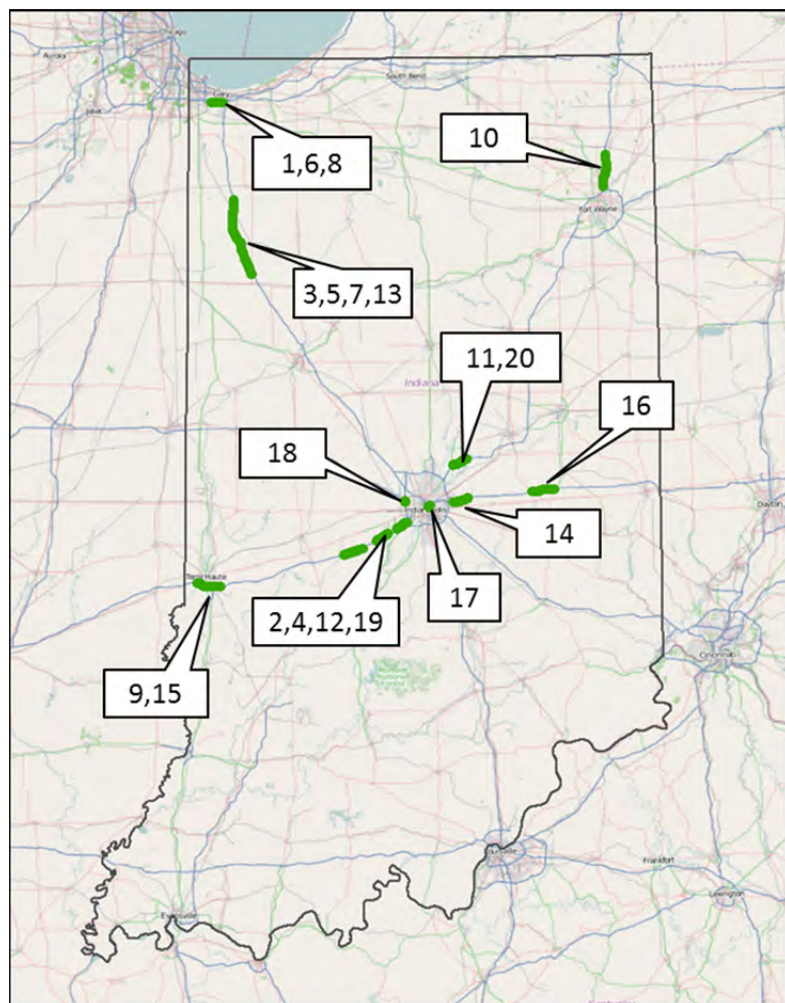


(a) Map

RANK	INTERSTATE	LENGTH (miles)	SEGMENTS (mile markers)	2011 DWCH	2012 DWCH
1	I-70 E	13.93	22.5 to 36.4	1797.5	3584.5
2	I-70 W	13.93	36.5 to 22.6	539.6	2409.2
3	I-74 E	0.52	72.0 to 72.5	2475.0	2096.1
4	I-65 S	0.77	260.4 to 259.7	821.7	1686.9
5	I-65 S	1.10	259.7 to 258.6	365.5	1584.8
6	I-70 W	9.01	49.5 to 40.6	680.4	1509.6
7	I-70 E	8.96	40.8 to 49.7	985.4	1473.6
8	I-65 N	1.07	258.4 to 259.4	872.1	1277.7
9	I-65 N	0.81	259.4 to 260.2	819.1	1103.2
10	I-69 N	1.59	202.9 to 204.5	450.6	883.6
11	I-69 S	5.02	210.4 to 205.6	1112.3	792.2
12	I-65 S	0.42	0.4 to 0.0	875.8	791.4
13	I-70 E	10.70	11.5 to 22.0	583.1	783.8
14	I-70 W	10.76	22.3 to 11.5	389.9	666.8
15	I-70 E	7.09	95.5 to 102.5	779.8	666.3
16	I-65 N	3.67	133.5 to 137.2	176.1	647.5
17	I-69 N	3.70	214.7 to 218.3	118.3	621.0
18	I-69 S	1.49	204.4 to 202.9	523.9	596.4
19	I-70 W	6.15	56.0 to 49.8	478.3	592.1
20	I-69 N	3.15	219.0 to 222.2	111.0	587.3

(b) Table

Figure E.6. Top 20 distance-weighted congestion hour (DWCH) segments throughout the Indiana interstate system, 2012.



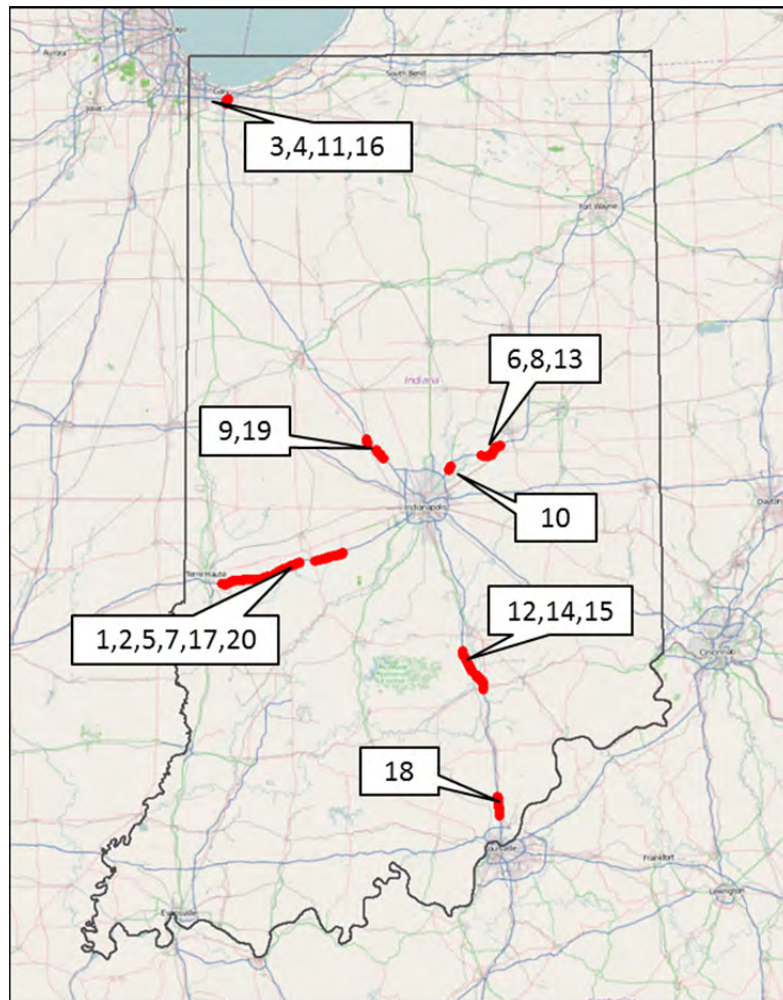
(a) Map

RANK	INTERSTATE	LENGTH (miles)	SEGMENTS (mile markers)	2011 DWCH	2012 DWCH	Difference (2011-2012)
1	I-94 E	1.80	6.9 to 8.7	1353.9	252.2	1101.7
2	I-70 W	4.55	65.5 to 60.5	1354.0	438.1	915.9
3	I-65 N	9.14	205.3 to 214.4	1003.3	125.7	877.6
4	I-70 W	4.04	72.4 to 68.4	860.1	56.5	803.6
5	I-65 S	9.20	214.7 to 205.5	834.8	124.2	710.6
6	I-94 E	0.73	9.8 to 10.5	894.7	201.9	692.8
7	I-65 S	14.28	229.6 to 215.3	1114.1	471.3	642.7
8	I-94 E	0.74	8.7 to 9.5	785.1	168.4	616.7
9	I-70 E	2.93	3.8 to 6.7	685.9	76.1	609.8
10	I-69 N	9.96	316.0 to 326.0	737.3	134.5	602.8
11	I-69 N	4.58	205.4 to 210.0	717.1	228.0	489.2
12	I-70 E	6.29	50.1 to 56.3	907.5	429.4	478.1
13	I-65 N	14.25	215.1 to 229.3	929.9	466.7	463.2
14	I-70 W	4.60	95.5 to 91.0	751.7	294.7	457.0
15	I-70 W	4.22	11.2 to 7.0	509.6	54.9	454.7
16	I-70 E	7.09	115.4 to 122.5	514.3	88.7	425.6
17	I-70 W	1.00	83.1 to 82.1	599.5	197.6	401.9
18	I-74 E	0.52	72.0 to 72.5	2475.0	2096.1	378.8
19	I-70 E	4.45	60.5 to 65.5	814.6	481.2	333.4
20	I-69 S	5.02	210.4 to 205.6	1112.3	792.2	320.1

(b) Table

Figure E.7. Most improved interstate segments based on distance-weighted congestion hours (DWCH).



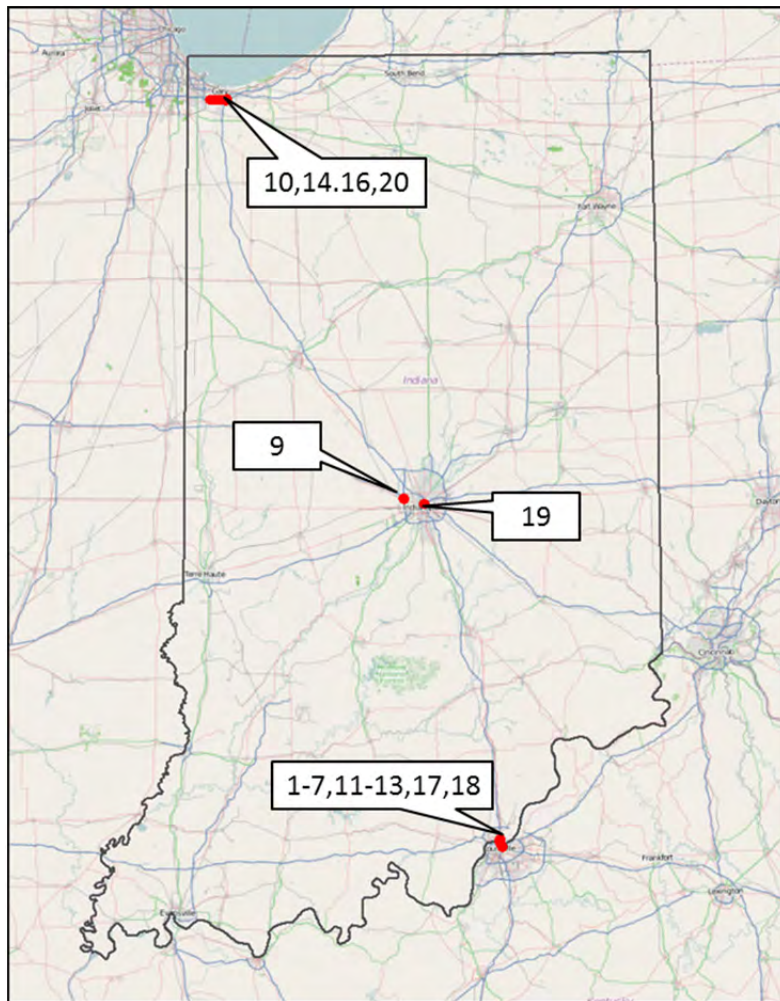


(a) Map

RANK	INTERSTATE	LENGTH (miles)	SEGMENTS (mile markers)	2011 DWCH	2012 DWCH	Difference (2011-2012)
1	I-70 W	13.93	36.5 to 22.6	539.6	2409.2	-1869.6
2	I-70 E	13.93	22.5 to 36.4	1797.5	3584.5	-1787.0
3	I-65 S	1.10	259.7 to 258.6	365.5	1584.8	-1219.3
4	I-65 S	0.77	260.4 to 259.7	821.7	1686.9	-865.2
5	I-70 W	9.01	49.5 to 40.6	680.4	1509.6	-829.1
6	I-69 N	3.70	214.7 to 218.3	118.3	621.0	-502.8
7	I-70 E	8.96	40.8 to 49.7	985.4	1473.6	-488.2
8	I-69 N	3.15	219.0 to 222.2	111.0	587.3	-476.3
9	I-65 N	3.67	133.5 to 137.2	176.1	647.5	-471.4
10	I-69 N	1.59	202.9 to 204.5	450.6	883.6	-433.1
11	I-65 N	1.07	258.4 to 259.4	872.1	1277.7	-405.6
12	I-65 S	5.34	55.5 to 50.2	132.3	530.4	-398.1
13	I-69 S	3.53	258.8 to 255.3	38.9	395.6	-356.8
14	I-65 N	5.35	49.9 to 55.3	60.2	369.5	-309.2
15	I-65 S	6.97	63.9 to 56.9	224.8	509.0	-284.1
16	I-65 N	0.81	259.4 to 260.2	819.1	1103.2	-284.0
17	I-70 W	10.76	22.3 to 11.5	389.9	666.8	-277.0
18	I-65 N	5.98	9.7 to 15.7	124.1	388.8	-264.7
19	I-65 S	1.48	142.1 to 140.6	174.5	437.6	-263.2
20	I-70 E	10.70	11.5 to 22.0	583.1	783.8	-200.6

(b) Table

Figure E.8. Most degraded segments based on distance-weighted congestion hours (DWCH).

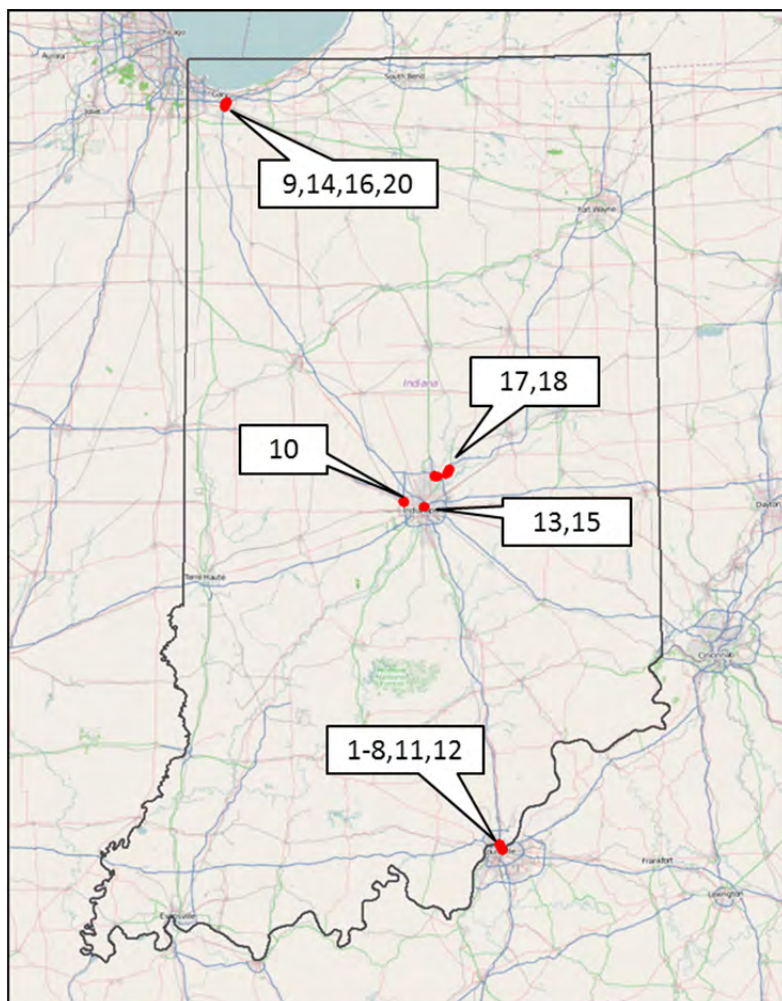


(a) Map

RANK	INTERSTATE	LENGTH (miles)	SEGMENTS (mile markers)	2011 SD (mph)	2012 SD (mph)
1	I-65 S	0.15	0.9 to 0.8	174803	126850
2	I-65 S	0.37	1.3 to 0.9	167553	115220
3	I-65 S	0.12	0.5 to 0.4	152519	116379
4	I-65 S	0.07	0.7 to 0.6	152336	112666
5	I-65 S	0.15	0.6 to 0.5	149220	110425
6	I-65 S	0.02	0.8 to 0.7	149136	111646
7	I-65 S	0.44	1.7 to 1.3	125240	77043
8	I-94 E	0.28	9.5 to 9.8	109367	16012
9	I-74 E	0.52	72.0 to 72.5	107103	56827
10	I-94 E	0.74	8.7 to 9.5	104014	11854
11	I-65 S	0.01	1.7 to 1.7	98730	51953
12	I-65 S	0.42	2.2 to 1.7	92325	50914
13	I-65 S	0.42	0.4 to 0.0	89510	82530
14	I-94 E	0.73	9.8 to 10.5	69255	12176
15	I-65 S	0.30	2.5 to 2.2	67203	31536
16	I-94 E	1.80	6.9 to 8.7	65481	6896
17	I-65 S	0.01	2.5 to 2.5	52503	21944
18	I-65 S	0.44	2.9 to 2.5	51023	20741
19	I-65 S	0.22	113.8 to 113.6	50125	43687
20	I-65 N	0.81	259.4 to 260.2	44020	42785

(b) Table

Figure E.9. Top 20 speed deficit (SD) segments throughout the Indiana interstate system, 2011.



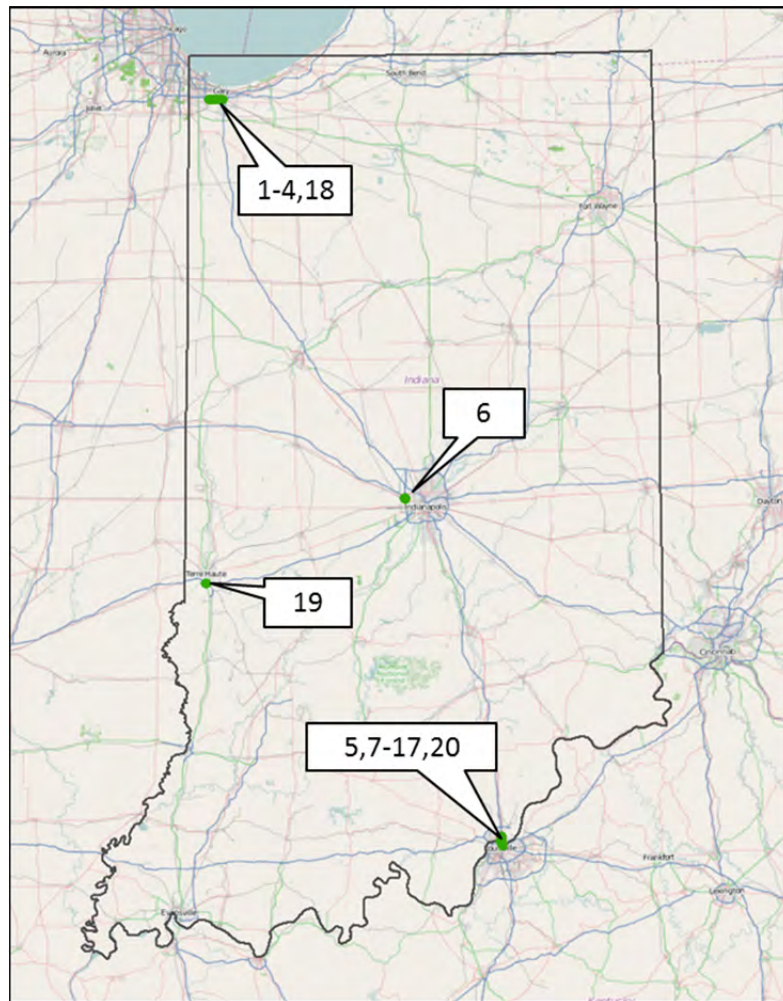
(a) Map

RANK	INTERSTATE	LENGTH (miles)	SEGMENTS (mile markers)	2011 SD (mph)	2012 SD (mph)
1	I-65 S	0.15	0.9 to 0.8	174803	126850
2	I-65 S	0.12	0.5 to 0.4	152519	116379
3	I-65 S	0.37	1.3 to 0.9	167553	115220
4	I-65 S	0.07	0.7 to 0.6	152336	112666
5	I-65 S	0.02	0.8 to 0.7	149136	111646
6	I-65 S	0.15	0.6 to 0.5	149220	110425
7	I-65 S	0.42	0.4 to 0.0	89510	82530
8	I-65 S	0.44	1.7 to 1.3	125240	77043
9	I-65 S	0.77	260.4 to 259.7	28541	73308
10	I-74 E	0.52	72.0 to 72.5	107103	56827
11	I-65 S	0.01	1.7 to 1.7	98730	51953
12	I-65 S	0.42	2.2 to 1.7	92325	50914
13	I-65 S	0.22	113.8 to 113.6	50125	43687
14	I-65 N	0.81	259.4 to 260.2	44020	42785
15	I-65 S	0.11	113.6 to 113.4	42321	36408
16	I-65 S	1.10	259.7 to 258.6	6430	35395
17	I-69 S	0.60	202.9 to 202.3	27872	35298
18	I-69 N	1.59	202.9 to 204.5	11909	35039
19	I-465 IL	1.03	33.0 to 34.1	27071	34837
20	I-65 N	1.07	258.4 to 259.4	25698	33353

(b) Table

Figure E.10. Top 20 speed deficit (SD) segments throughout the Indiana interstate system, 2012.



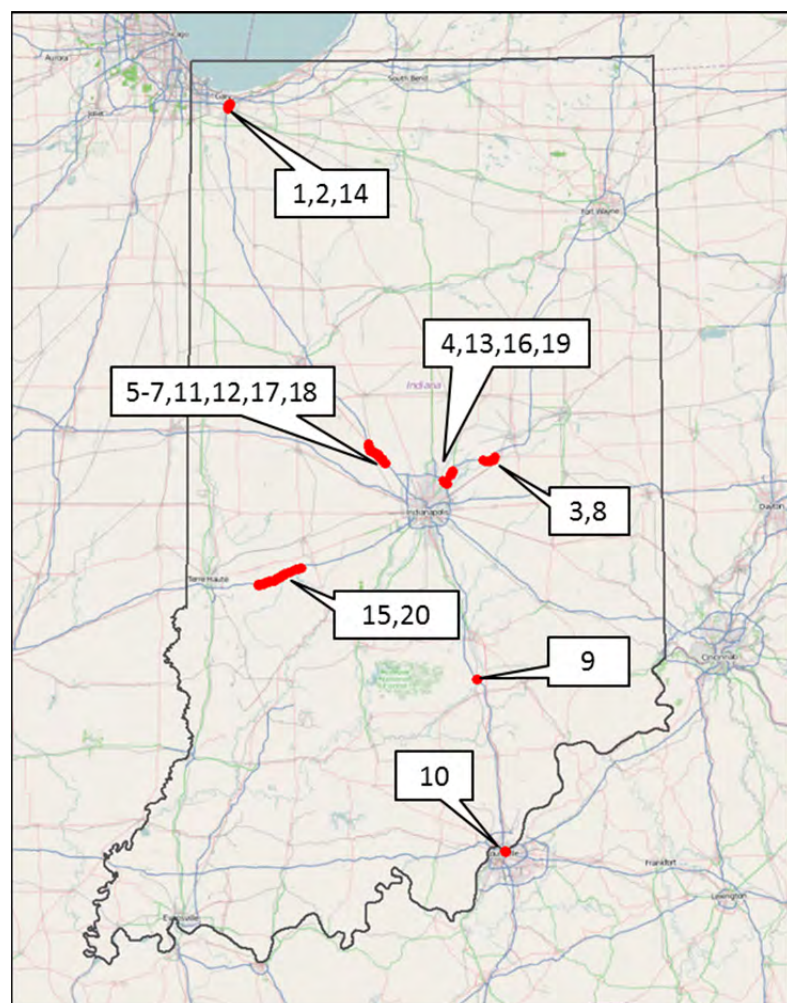


(a) Map

RANK	INTERSTATE	LENGTH (miles)	SEGMENTS (mile markers)	2011 SD (mph)	2012 SD (mph)	Difference (2011-2012)
1	I-94 E	0.28	9.5 to 9.8	109367	16012	93354
2	I-94 E	0.74	8.7 to 9.5	104014	11854	92160
3	I-94 E	1.80	6.9 to 8.7	65481	6896	58585
4	I-94 E	0.73	9.8 to 10.5	69255	12176	57079
5	I-65 S	0.37	1.3 to 0.9	167553	115220	52333
6	I-74 E	0.52	72.0 to 72.5	107103	56827	50277
7	I-65 S	0.44	1.7 to 1.3	125240	77043	48197
8	I-65 S	0.15	0.9 to 0.8	174803	126850	47953
9	I-65 S	0.01	1.7 to 1.7	98730	51953	46777
10	I-65 S	0.42	2.2 to 1.7	92325	50914	41410
11	I-65 S	0.07	0.7 to 0.6	152336	112666	39670
12	I-65 S	0.15	0.6 to 0.5	149220	110425	38795
13	I-65 S	0.02	0.8 to 0.7	149136	111646	37490
14	I-65 S	0.12	0.5 to 0.4	152519	116379	36140
15	I-65 S	0.30	2.5 to 2.2	67203	31536	35667
16	I-65 S	0.01	2.5 to 2.5	52503	21944	30559
17	I-65 S	0.44	2.9 to 2.5	51023	20741	30282
18	I-94 E	0.66	6.3 to 6.9	36781	7031	29751
19	I-70 E	0.41	6.7 to 7.1	29006	1759	27247
20	I-65 S	0.63	3.6 to 2.9	38886	15221	23666

(b) Table

Figure E.11. Most improved interstate segments based on speed deficit (SD).

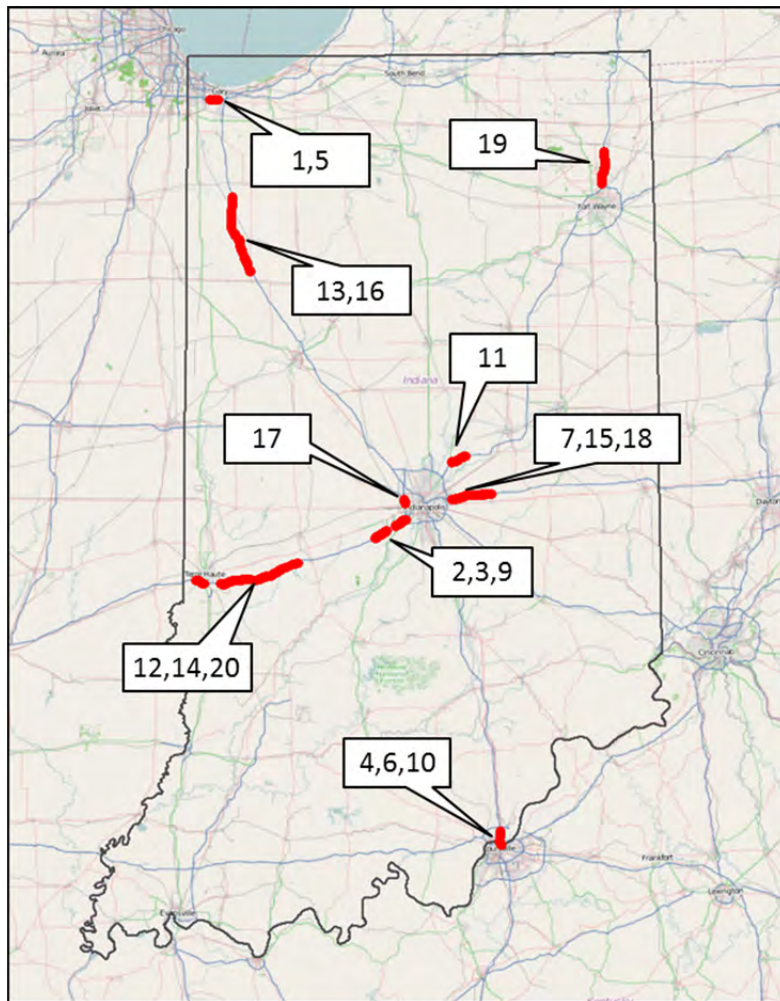


(a) Map

RANK	INTERSTATE	LENGTH (miles)	SEGMENTS (mile markers)	2011 SD (mph)	2012 SD (mph)	Difference (2011-2012)
1	I-65 S	0.77	260.4 to 259.7	28541	73308	-44767
2	I-65 S	1.10	259.7 to 258.6	6430	35395	-28965
3	I-69 N	0.61	218.3 to 219.0	1026	26604	-25577
4	I-69 N	1.59	202.9 to 204.5	11909	35039	-23129
5	I-65 N	0.84	137.8 to 138.7	4748	20264	-15516
6	I-65 S	0.37	140.6 to 140.2	13077	27225	-14148
7	I-65 S	1.48	142.1 to 140.6	7487	21518	-14032
8	I-69 N	3.70	214.7 to 218.3	1565	13486	-11921
9	I-65 S	0.37	55.9 to 55.5	2031	13635	-11605
10	I-65 N	0.33	0.0 to 0.3	7643	19126	-11484
11	I-65 N	0.35	138.7 to 139.0	6786	17882	-11096
12	I-65 S	1.00	140.2 to 139.2	14329	25365	-11035
13	I-465 OL	0.92	37.1 to 36.2	4985	15670	-10685
14	I-65 S	0.28	258.6 to 258.3	4613	13980	-9368
15	I-70 E	13.93	22.5 to 36.4	5070	13869	-8799
16	I-465 OL	0.77	36.2 to 35.4	5284	13915	-8631
17	I-65 N	0.62	137.2 to 137.8	2565	11080	-8515
18	I-65 N	3.67	133.5 to 137.2	2805	11211	-8406
19	I-69 N	0.62	202.3 to 202.9	9299	17554	-8255
20	I-70 W	0.57	22.6 to 22.3	716	8767	-8051

(b) Table

Figure E.12. Most degraded segments based on speed deficit (SD).



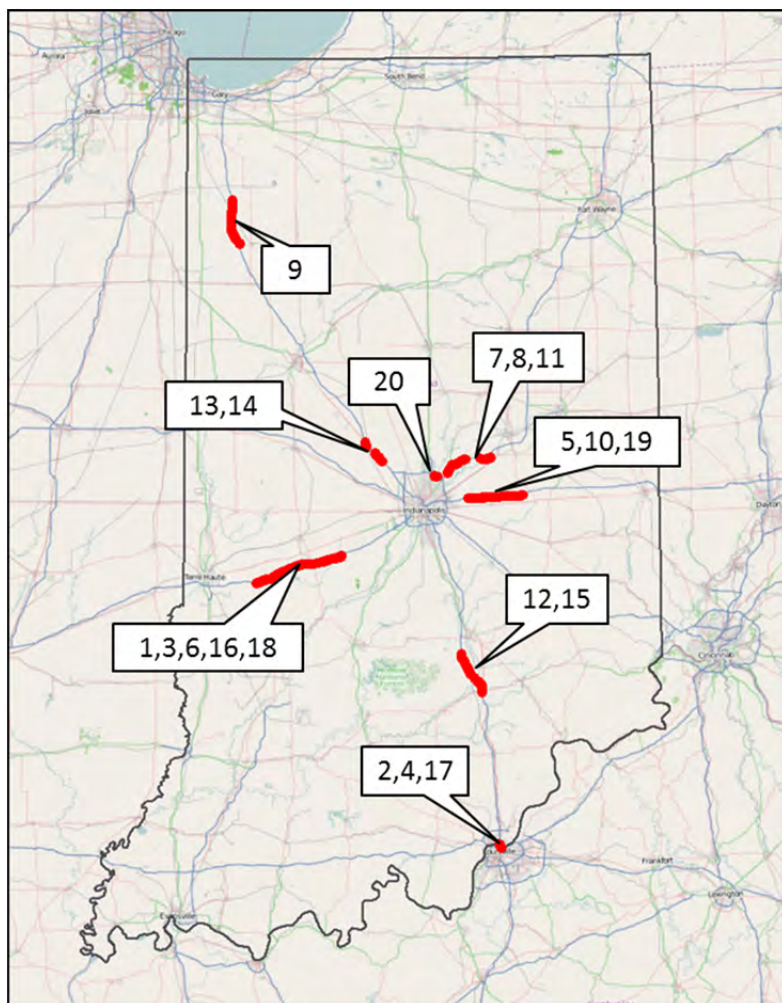
(a) Map

RANK	INTERSTATE	LENGTH (miles)	SEGMENTS (mile markers)	2011 TTD (hours)	2012 TTD (hours)
1	I-94 E	1.80	6.9 to 8.7	153.6	11.8
2	I-70 W	4.55	65.5 to 60.5	143.4	39.0
3	I-70 W	4.04	72.4 to 68.4	118.8	1.9
4	I-65 S	0.44	1.7 to 1.3	111.6	77.2
5	I-94 E	0.74	8.7 to 9.5	108.1	8.4
6	I-65 S	0.37	1.3 to 0.9	104.8	82.5
7	I-70 W	7.11	103.0 to 95.9	90.4	75.5
8	I-65 S	0.42	2.2 to 1.7	85.9	50.4
9	I-70 E	4.45	60.5 to 65.5	79.2	25.5
10	I-65 S	1.78	5.3 to 3.6	77.5	37.2
11	I-69 S	5.02	210.4 to 205.6	75.5	60.1
12	I-70 E	2.93	3.8 to 6.7	67.3	10.3
13	I-65 N	9.14	205.3 to 214.4	66.3	2.5
14	I-70 E	13.93	22.5 to 36.4	66.0	174.1
15	I-70 E	7.09	95.5 to 102.5	65.0	60.6
16	I-65 S	14.28	229.6 to 215.3	64.3	27.8
17	I-465 IL	1.30	13.9 to 15.2	59.7	22.3
18	I-70 W	4.60	95.5 to 91.0	58.6	14.4
19	I-69 N	9.96	316.0 to 326.0	57.3	10.9
20	I-70 E	10.70	11.5 to 22.0	56.8	29.5

(b) Table

Figure E.13. Top 20 travel time deficit (TTD) segments throughout the Indiana interstate system, 2011.



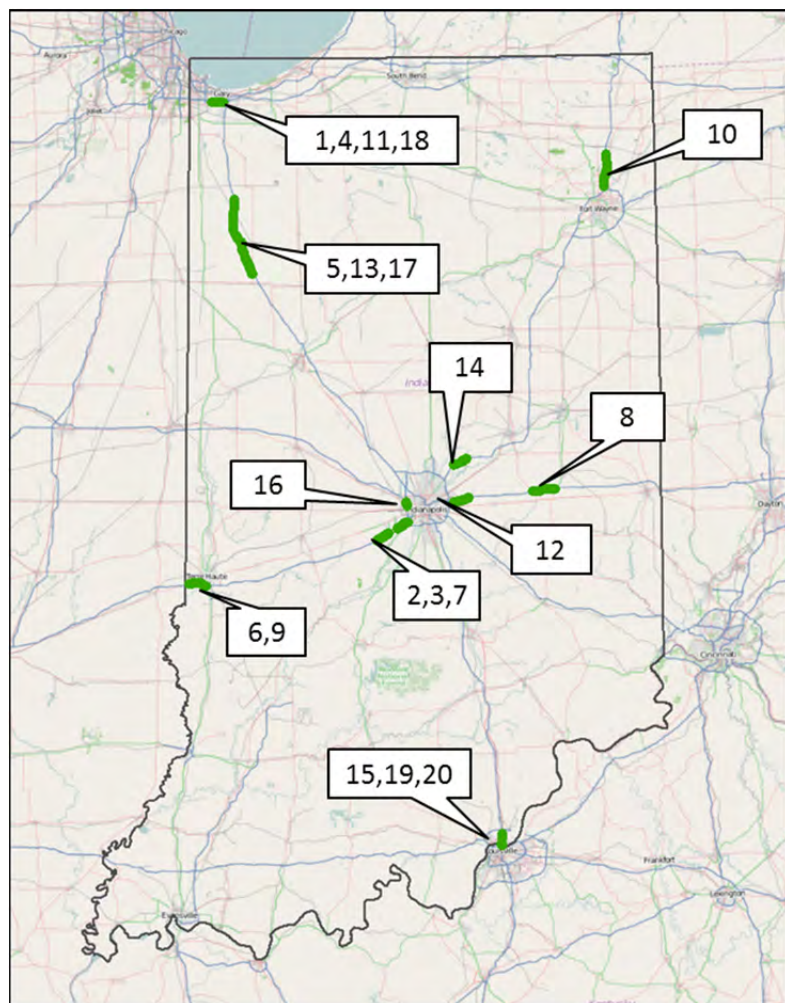


(a) Map

RANK	INTERSTATE	LENGTH (miles)	SEGMENTS (mile markers)	2011 TTD (hours)	2012 TTD (hours)
1	I-70 E	13.93	22.5 to 36.4	66.0	174.1
2	I-65 S	0.37	1.3 to 0.9	104.8	82.5
3	I-70 W	13.93	36.5 to 22.6	18.2	82.0
4	I-65 S	0.44	1.7 to 1.3	111.6	77.2
5	I-70 W	7.11	103.0 to 95.9	90.4	75.5
6	I-70 W	9.01	49.5 to 40.6	28.3	75.2
7	I-69 N	3.70	214.7 to 218.3	6.1	72.7
8	I-69 N	1.59	202.9 to 204.5	17.1	63.3
9	I-65 N	14.25	215.1 to 229.3	52.1	61.3
10	I-70 E	7.09	95.5 to 102.5	65.0	60.6
11	I-69 S	5.02	210.4 to 205.6	75.5	60.1
12	I-65 N	5.35	49.9 to 55.3	7.5	59.4
13	I-65 S	1.48	142.1 to 140.6	16.8	55.3
14	I-65 N	3.67	133.5 to 137.2	15.6	53.5
15	I-65 S	6.97	63.9 to 56.9	37.3	52.8
16	I-70 E	3.46	36.9 to 40.3	16.9	50.8
17	I-65 S	0.42	2.2 to 1.7	85.9	50.4
18	I-70 E	8.96	40.8 to 49.7	41.3	47.6
19	I-70 W	8.85	112.5 to 103.6	21.1	45.3
20	I-465 IL	1.03	33.0 to 34.1	31.1	44.8

(b) Table

Figure E.14. Top 20 travel time deficit (TTD) segments throughout the Indiana interstate system, 2012.

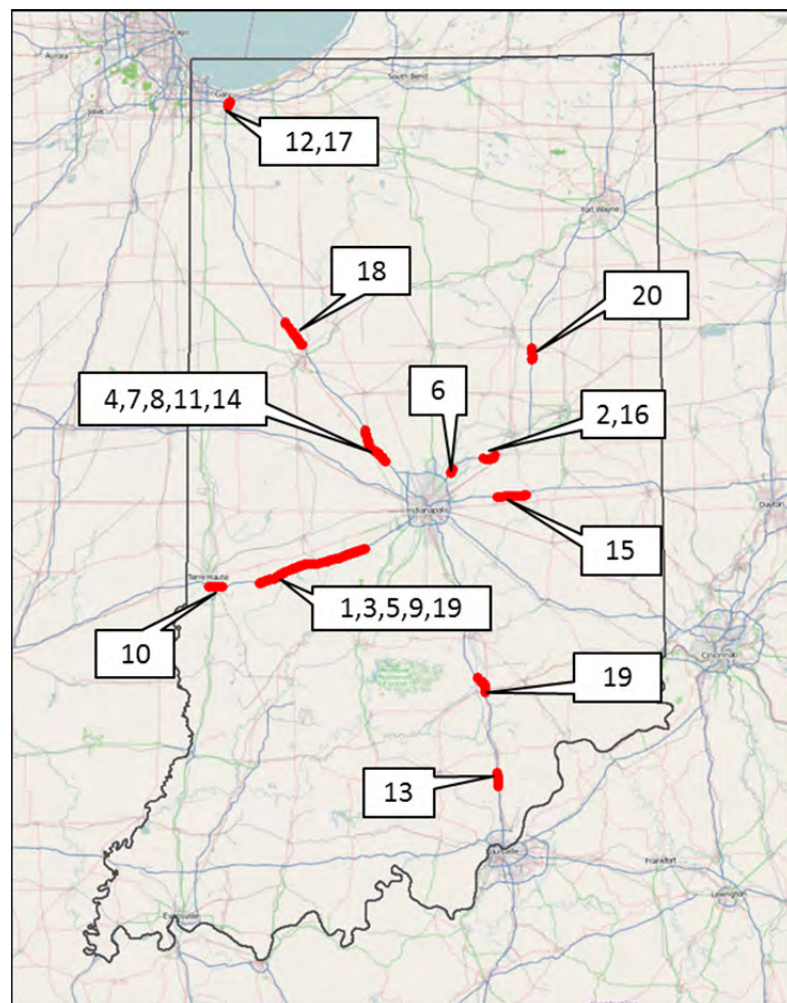


(a) Map

RANK	INTERSTATE	LENGTH (miles)	SEGMENTS (mile markers)	2011 TTD (hours)	2012 TTD (hours)	Difference (2011-2012)
1	I-94 E	1.80	6.9 to 8.7	153.6	11.8	141.8
2	I-70 W	4.04	72.4 to 68.4	118.8	1.9	116.9
3	I-70 W	4.55	65.5 to 60.5	143.4	39.0	104.4
4	I-94 E	0.74	8.7 to 9.5	108.1	8.4	99.7
5	I-65 N	9.14	205.3 to 214.4	66.3	2.5	63.8
6	I-70 E	2.93	3.8 to 6.7	67.3	10.3	57.0
7	I-70 E	4.45	60.5 to 65.5	79.2	25.5	53.6
8	I-70 E	7.09	115.4 to 122.5	50.6	2.1	48.5
9	I-70 E	2.32	0.9 to 3.2	56.7	8.4	48.3
10	I-69 N	9.96	316.0 to 326.0	57.3	10.9	46.4
11	I-94 E	0.73	9.8 to 10.5	54.6	9.4	45.2
12	I-70 W	4.60	95.5 to 91.0	58.6	14.4	44.2
13	I-65 S	9.20	214.7 to 205.5	49.5	6.7	42.9
14	I-69 N	4.58	205.4 to 210.0	53.0	11.9	41.1
15	I-65 S	1.78	5.3 to 3.6	77.5	37.2	40.4
16	I-465 IL	1.30	13.9 to 15.2	59.7	22.3	37.4
17	I-65 S	14.28	229.6 to 215.3	64.3	27.8	36.4
18	I-94 E	0.28	9.5 to 9.8	40.6	4.5	36.0
19	I-65 S	0.42	2.2 to 1.7	85.9	50.4	35.5
20	I-65 S	0.44	1.7 to 1.3	111.6	77.2	34.3

(b) Table

Figure E.15. Most improved interstate segments based on travel time deficit (TTD).



(a) Map

RANK	INTERSTATE	LENGTH (miles)	SEGMENTS (mile markers)	2011 TTD (hours)	2012 TTD (hours)	Difference (2011-2012)
1	I-70 E	13.93	22.5 to 36.4	66.0	174.1	-108.1
2	I-69 N	3.70	214.7 to 218.3	6.1	72.7	-66.6
3	I-70 W	13.93	36.5 to 22.6	18.2	82.0	-63.8
4	I-65 N	5.35	49.9 to 55.3	7.5	59.4	-51.9
5	I-70 W	9.01	49.5 to 40.6	28.3	75.2	-46.9
6	I-69 N	1.59	202.9 to 204.5	17.1	63.3	-46.3
7	I-65 S	1.48	142.1 to 140.6	16.8	55.3	-38.5
8	I-65 N	3.67	133.5 to 137.2	15.6	53.5	-37.9
9	I-70 E	3.46	36.9 to 40.3	16.9	50.8	-33.9
10	I-70 E	4.21	7.1 to 11.3	3.9	35.4	-31.5
11	I-65 S	3.53	145.8 to 142.3	12.3	39.3	-27.0
12	I-65 S	0.77	260.4 to 259.7	14.5	41.4	-26.9
13	I-65 S	4.23	24.1 to 19.9	5.7	32.5	-26.9
14	I-65 N	0.84	137.8 to 138.7	5.0	29.2	-24.2
15	I-70 W	8.85	112.5 to 103.6	21.1	45.3	-24.1
16	I-69 N	0.61	218.3 to 219.0	0.9	23.8	-22.9
17	I-65 S	1.10	259.7 to 258.6	5.1	26.9	-21.9
18	I-65 S	9.02	187.9 to 178.9	0.8	22.7	-21.8
19	I-70 W	6.15	56.0 to 49.8	19.9	41.2	-21.3
20	I-69 S	3.53	258.8 to 255.3	4.3	24.5	-20.2

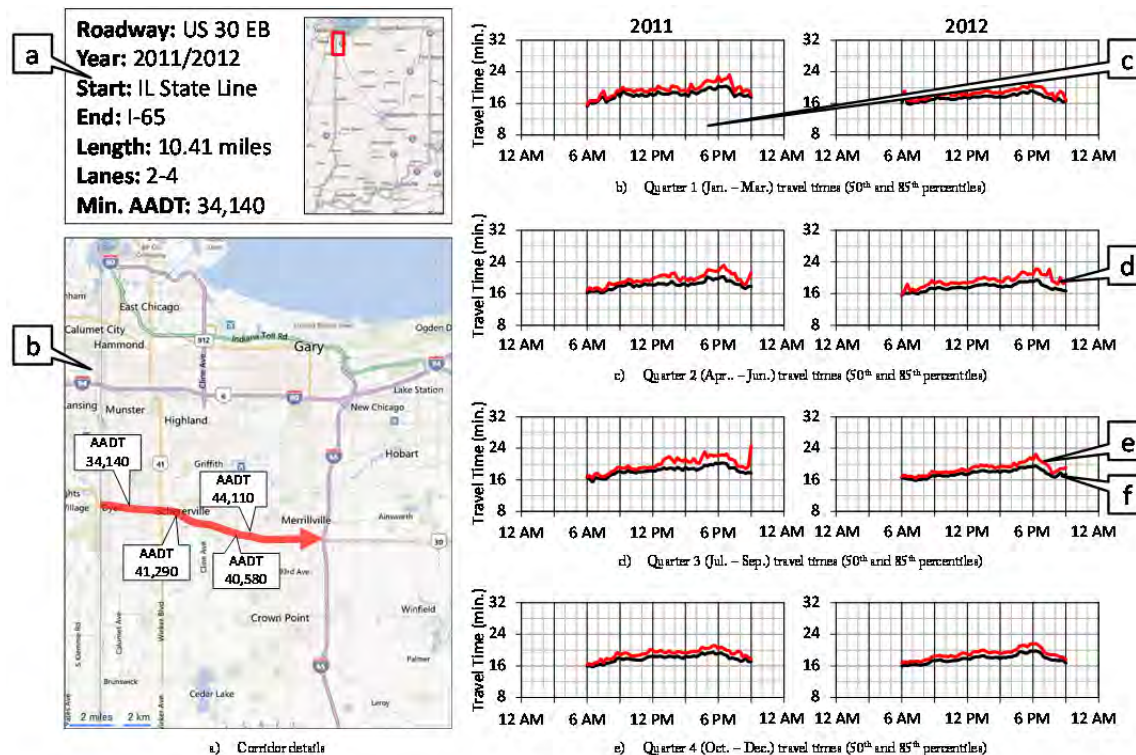
(b) Table

Figure E.16. Most degraded segments based on travel time deficit (TTD).



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# Appendix F: 2011 & 2012 Interstate and Arterial Corridor Travel Time Summaries



**Summary:** This section includes travel time summaries for 30 commuter corridors selected for both arterials and interstates across the state of Indiana. Median (black line) and 85th percentile (red line) travel times are shown by time of day for the four quarters of both 2011 and 2012.

- a. Corridor information
- b. Corridor map
- c. 2011 Quarter 1 travel time summary
- d. 2012 Quarter 2 travel time summary
- e. 85th percentile travel time expected in 2012 Quarter 3
- f. Median travel time expected in 2012 Quarter 3



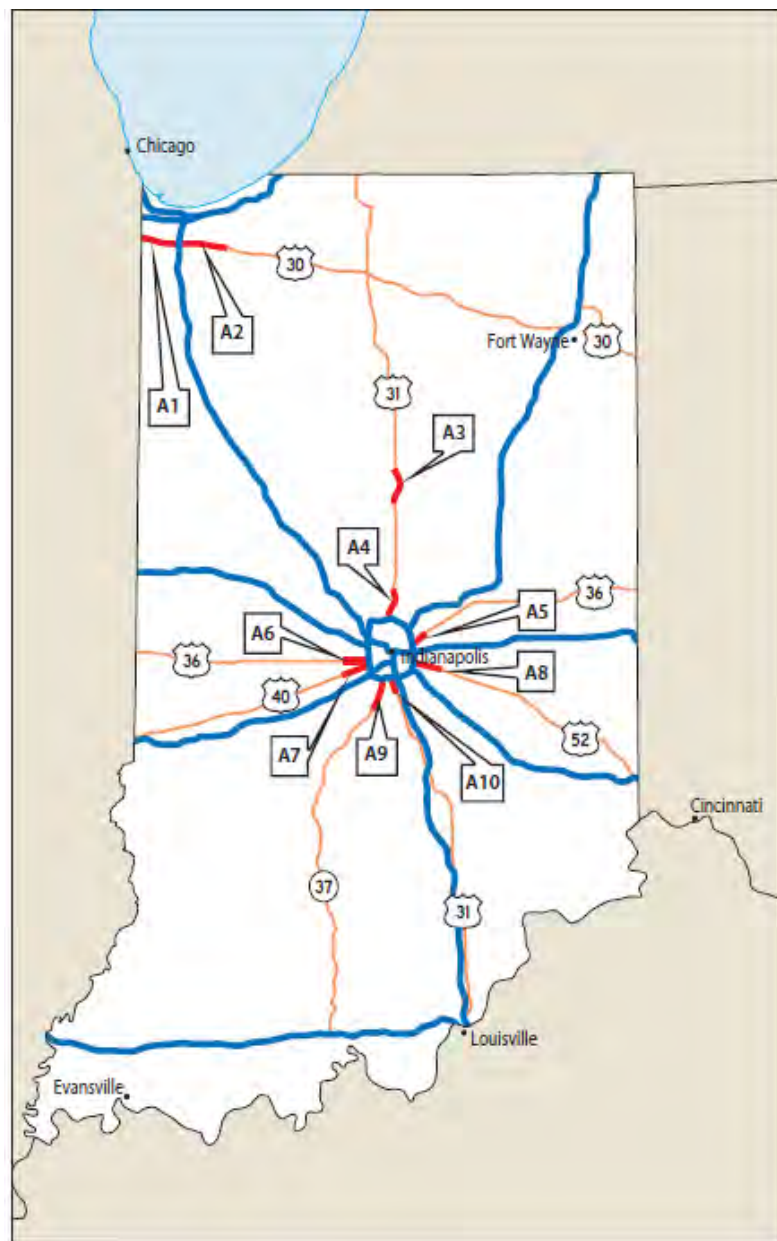
(a) Map

Interstate	Common Name	Corridor Code	Direction	Closest Starting Mile Marker	Closest Ending Mile Marker	Report Page No.
Northern Region						
I-65	US-30 to I-94	G-1	NB	253	259	180
			SB	259	253	181
I-94	I-65 to Michigan state line	G-2	EB	12	45	182
			WB	45	12	183
I-80	I-65 to Illinois state line	G-3	EB	00	11.5	184
			WB	11.5	00	185
Central Region						
I-65	I-465 to Downtown Split (northern Indianapolis)	I-1	NB	112	123	186
			SB	123	112	187
I-65	I-865 to I-465 (northern Indianapolis)	I-2	NB	123	129	188
			SB	129	123	189
I-65	Greenwood to I-465 (southern Indianapolis)	I-3	NB	99	106	190
			SB	106	99	191
I-65	I-465 to Downtown Split (southern Indianapolis)	I-4	NB	106	110	192
			SB	110	106	193
I-70	Indianapolis International airport to downtown split	I-5	EB	71.5	80	194
			WB	80	71.5	195
I-70	I-465 to downtown split (eastern Indianapolis)	I-6	EB	83	89	196
			WB	89	83	197
I-70	Mt. Comfort to I-465 (eastern Indianapolis)	I-7	EB	90	96	198
			WB	96	90	199
I-74	Brownsburg to I-465 (northwest Indianapolis)	I-8	EB	66	73	200
			WB	73	66	201
I-74	Fairland to I-465 (southeast Indianapolis)	I-9	EB	94	99	202
			WB	99	94	203
I-69	Fishers to I-465	I-10	NB	00	10	204
			SB	10	00	205
I-465	I-70 to I-65 (eastern Indianapolis)	I-11	EB	53	44	206
			WB	44	53	207
I-465	I-70 to I-65 (western Indianapolis)	I-12	EB	09	00	208
			WB	00	09	209
Southern Region						
I-265	I-64 to I-65	L-1	EB	00	06	210
			WB	06	00	211
I-64	I-265 to Kentucky state line	L-2	EB	122	123.5	212
			WB	123.5	122	213
I-64	Duncan to I-265	L-3	EB	118	121	214
			WB	121	118	215
I-65	I-265 to Kentucky state line	L-4	NB	00	06	216
			SB	06	00	217
I-65	Sellersburg to I-265	L-5	NB	06	09	218
			SB	09	06	219

(b) Table

Figure F.1. Interstate commuter corridors included in this report.



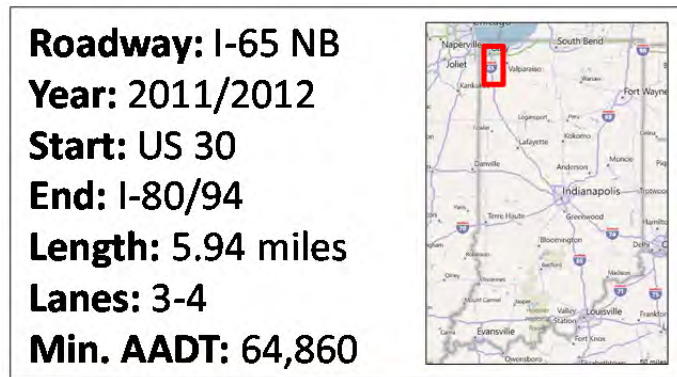


(a) Map

Arterial	City	Corridor Code	Direction	Closest Starting Point	Closest Ending Point	Report Page No.
<i>Arterial Corridors</i>						
US 30	Merrillville (west of I-65)	A-1	EB	IL state line	I-65	220
			WB	I-65	IL state line	221
US 30	Merrillville (east of I-65)	A-2	EB	I-65	SR 2	222
			WB	SR 2	I-65	223
US 31	Kokomo (north of Indianapolis)	A-3	NB	SR 26	US 35	224
			SB	US 35	SR 26	225
US 31	Carmel (north of Indianapolis)	A-4	NB	I-465	SR 32	226
			SB	SR 32	I-465	227
US 36	Lawrence (NE of Indianapolis)	A-5	EB	I-465	German Church	228
			WB	German Church	I-465	229
US 36	Avon (west of Indianapolis)	A-6	EB	SR 267	I-465	230
			WB	I-465	SR 267	231
US 40	Plainfield (west of Indianapolis)	A-7	EB	SR 267	I-465	232
			WB	I-465	SR 267	233
US 52	New Palestine (east of Indianapolis)	A-8	EB	I-465	N. Palestine	234
			WB	N. Palestine	I-465	235
SR 37	Perry (SW of Indianapolis)	A-9	EB	SR 144	I-465	236
			WB	I-465	SR 144	237
US 31	Greenwood (south of Indianapolis)	A-10	NB	Greenwood	I-465	238
			SB	I-465	Greenwood	239

(b) Table

Figure F.2. Arterial commuter corridors included in this report.



(a) Corridor details

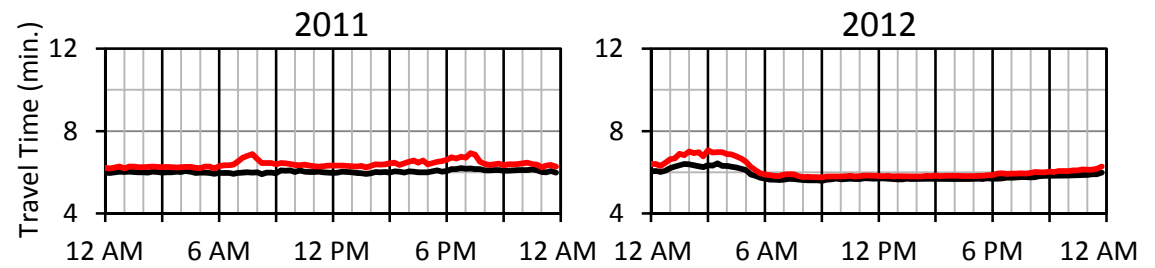
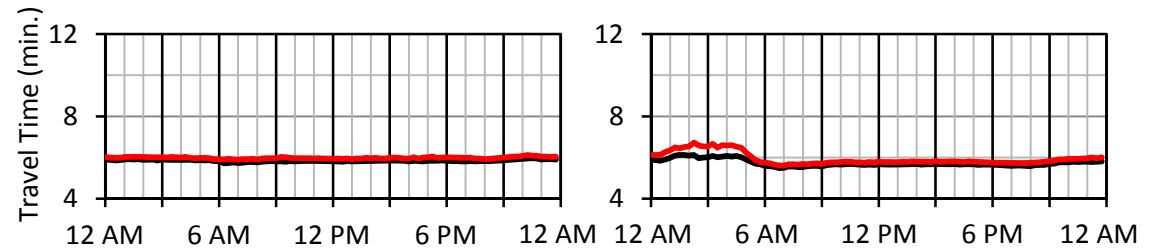
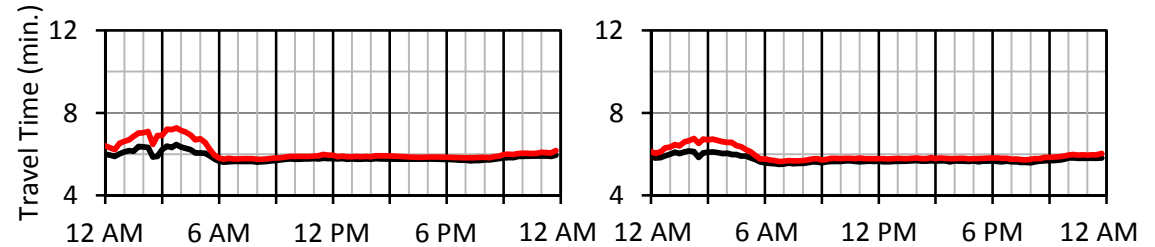
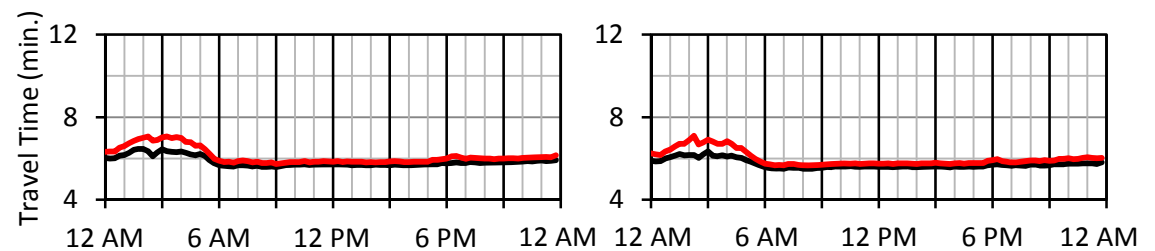
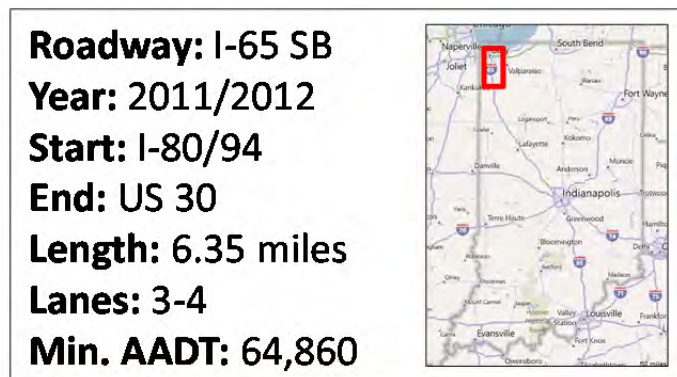
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.3. 2011 &amp; 2012 Northbound I-65 (US 30 to I-80/94): Quarterly travel time summary.



(a) Corridor details

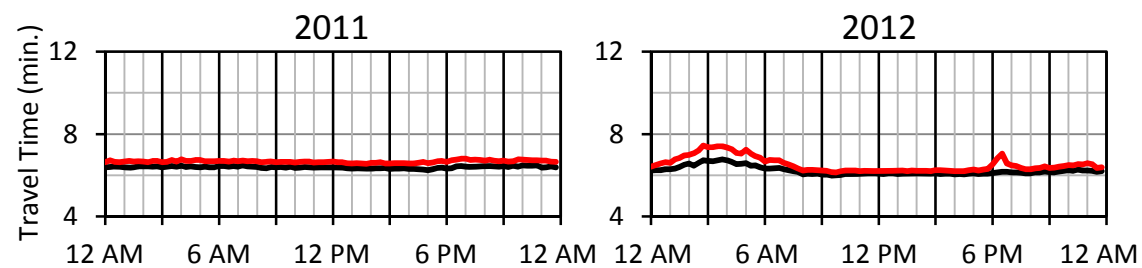
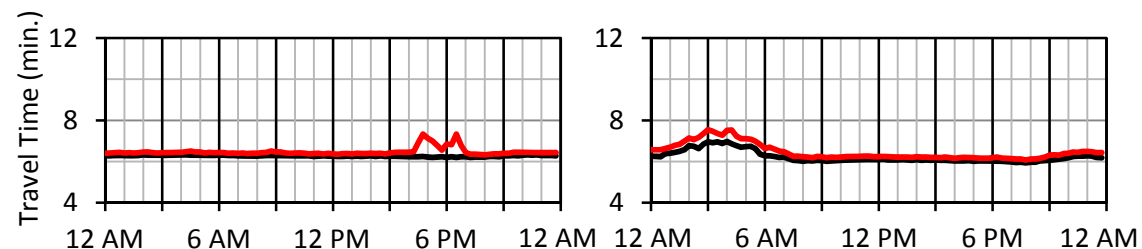
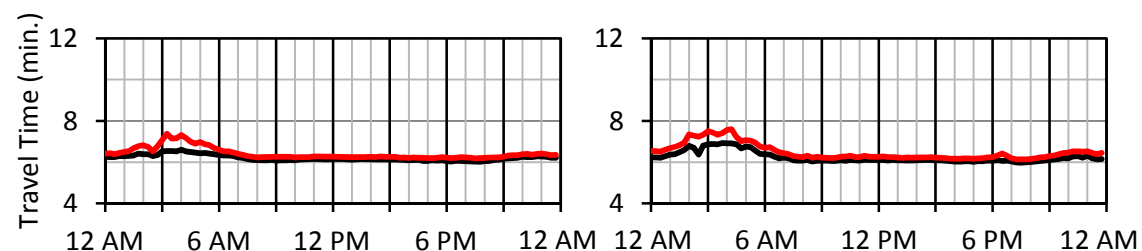
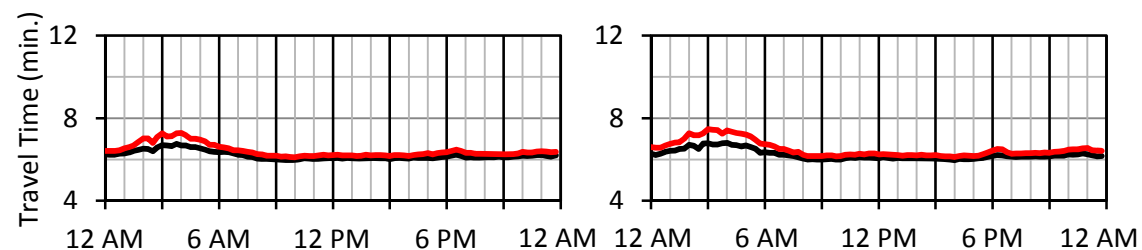
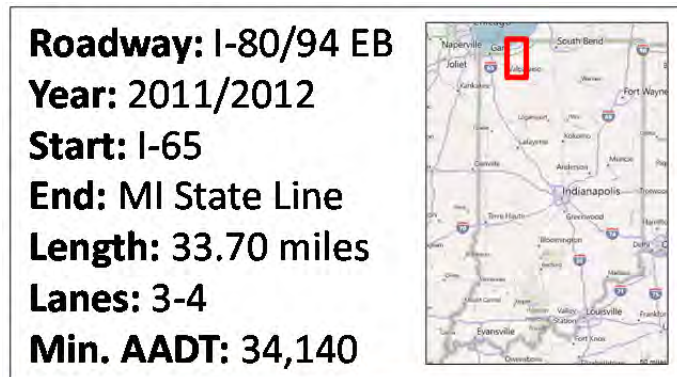
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.4. 2011 &amp; 2012 Southbound I-65 (I-80/94 to US 30): Quarterly travel time summary.





(a) Corridor details

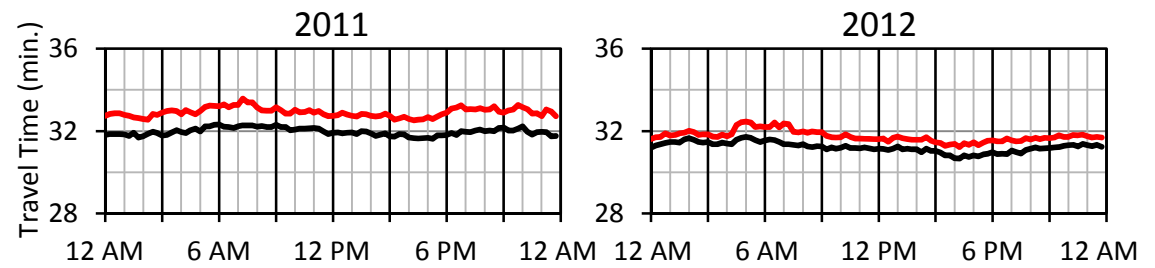
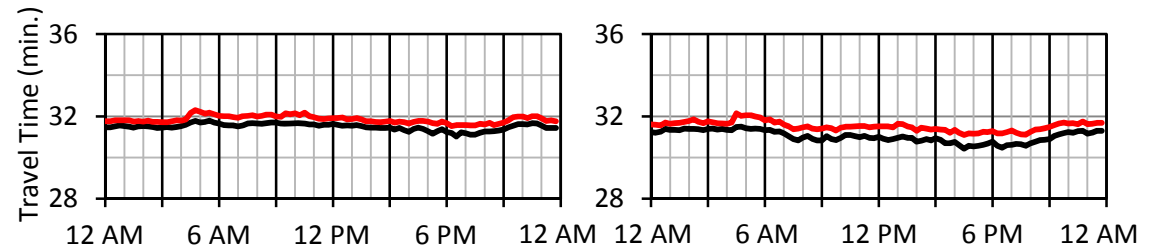
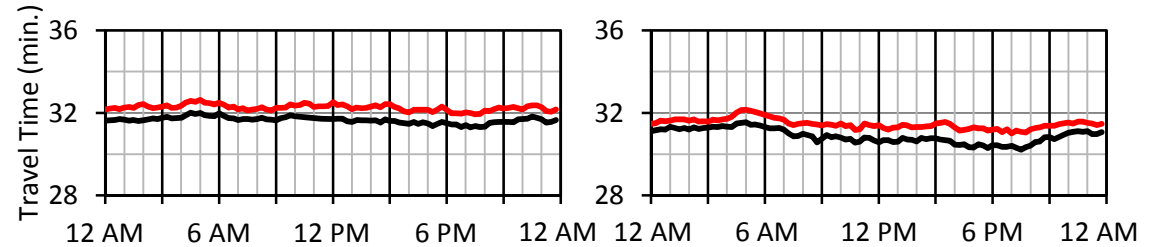
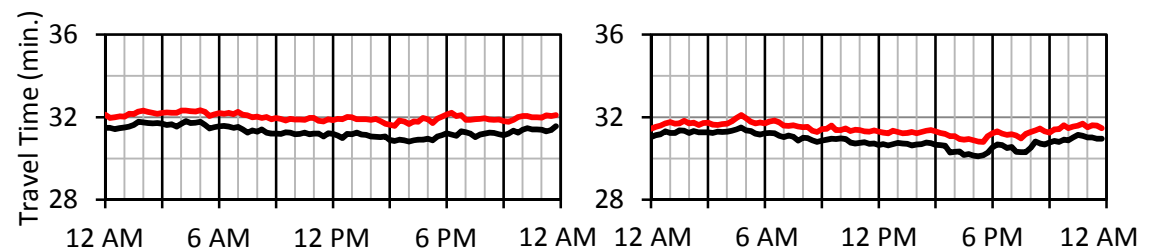
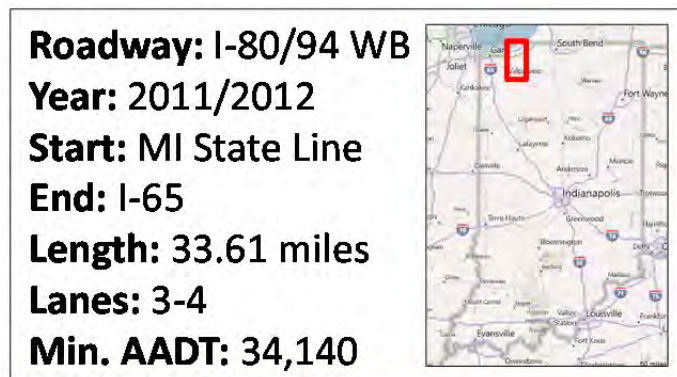
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.5. 2011 &amp; 2012 Eastbound I-80/94 (I-65 to Michigan state line): Quarterly travel time summary.



(a) Corridor details

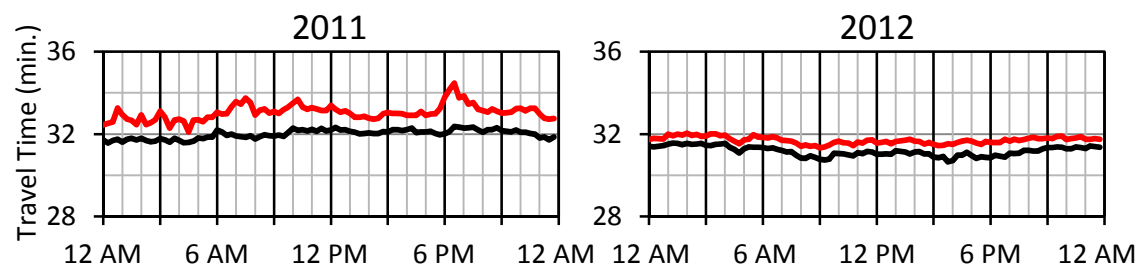
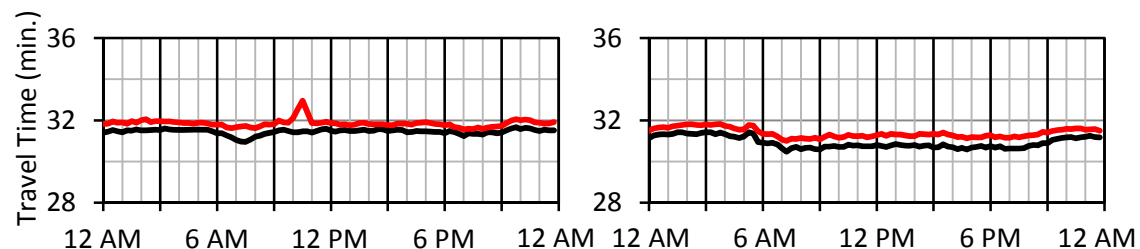
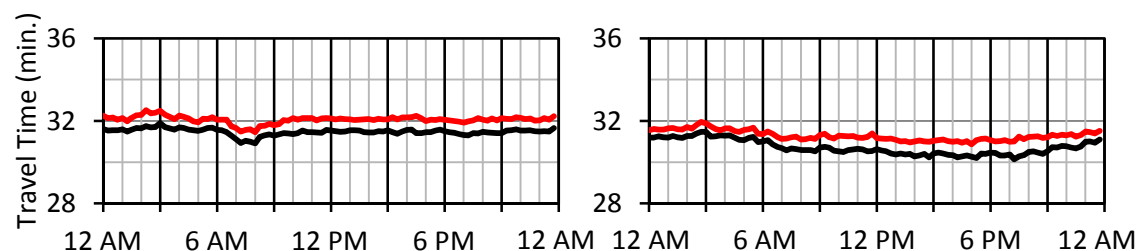
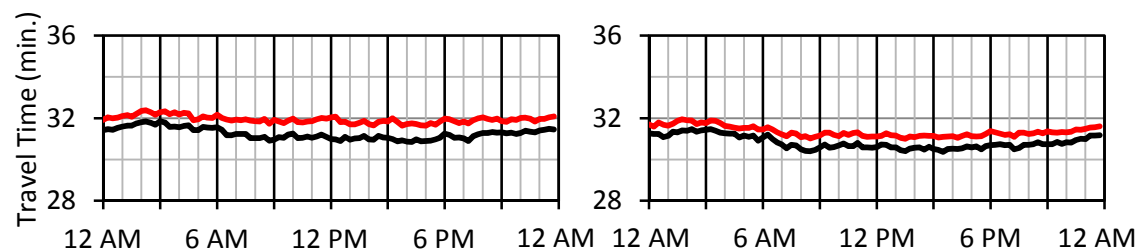
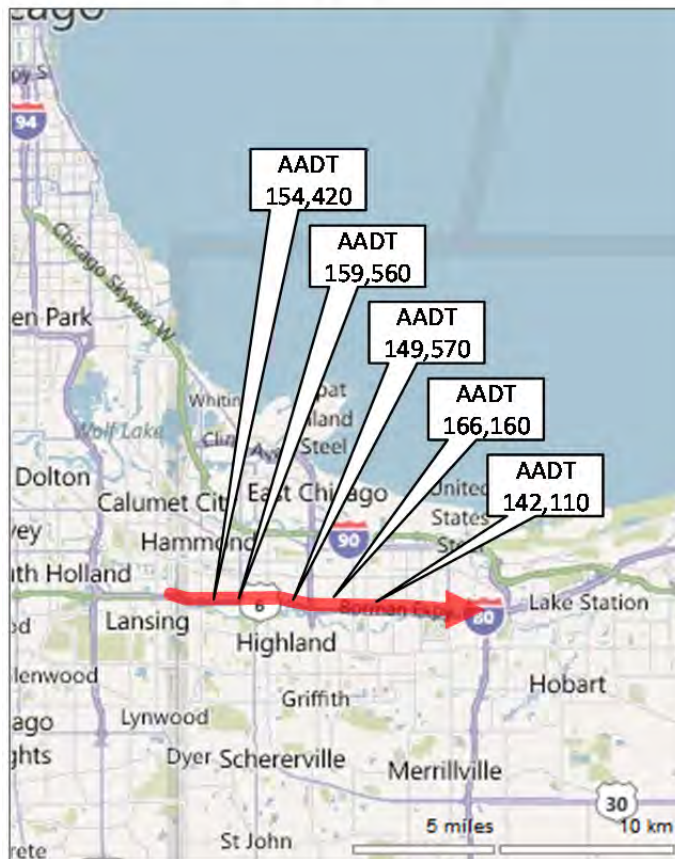
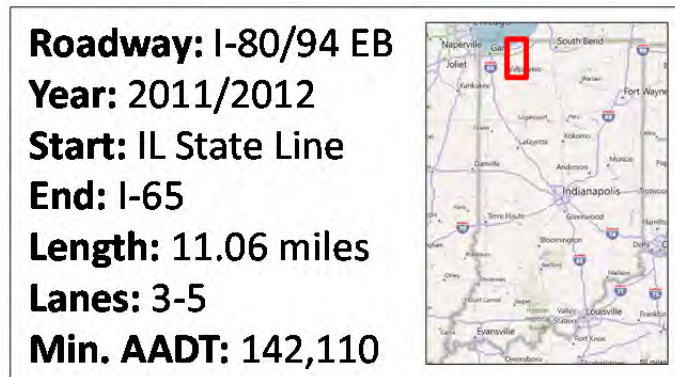
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.6. 2011 &amp; 2012 Westbound I-80/94 (Michigan state line to I-65): Quarterly travel time summary.



(a) Corridor details

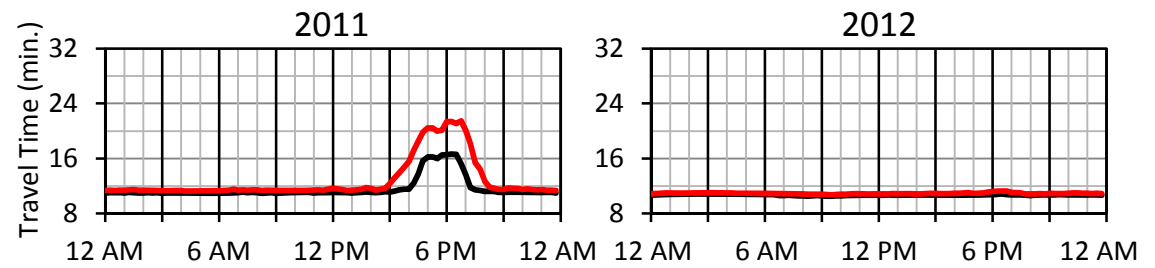
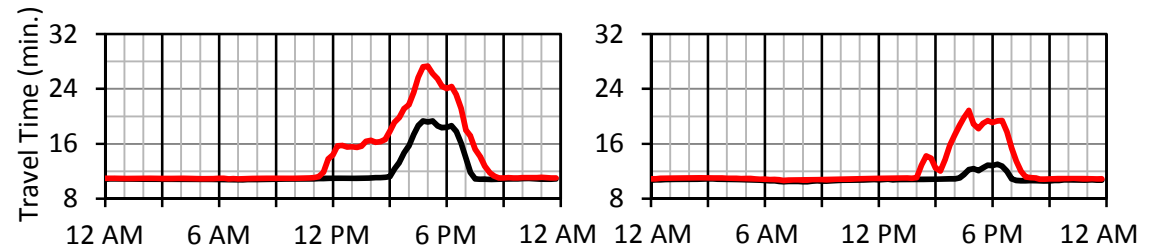
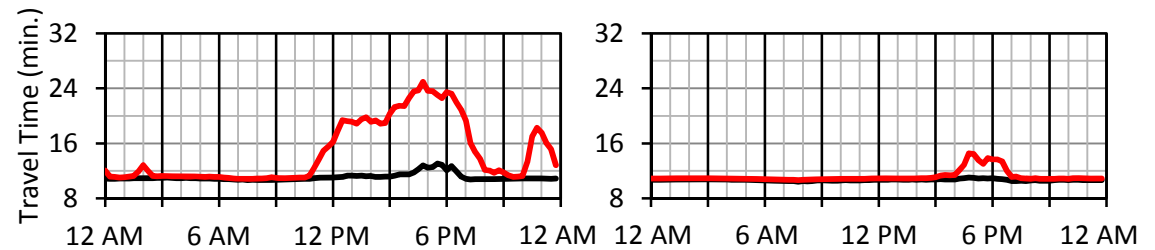
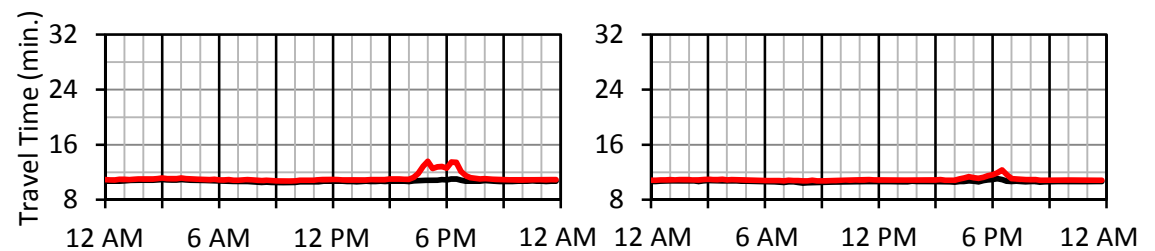
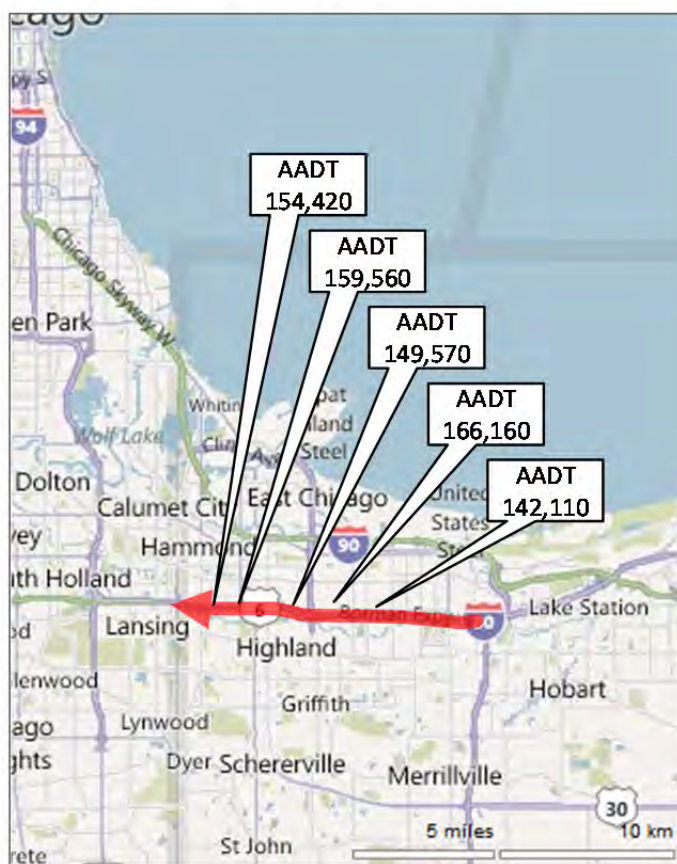
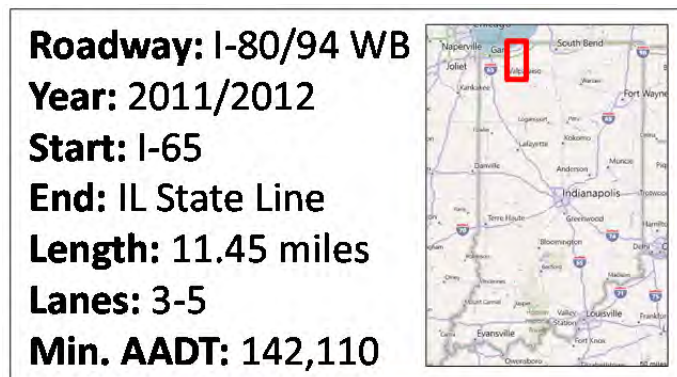
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.7. 2011 &amp; 2012 Eastbound I-80/94 (Illinois state line to I-65): Quarterly travel time summary.





(a) Corridor details

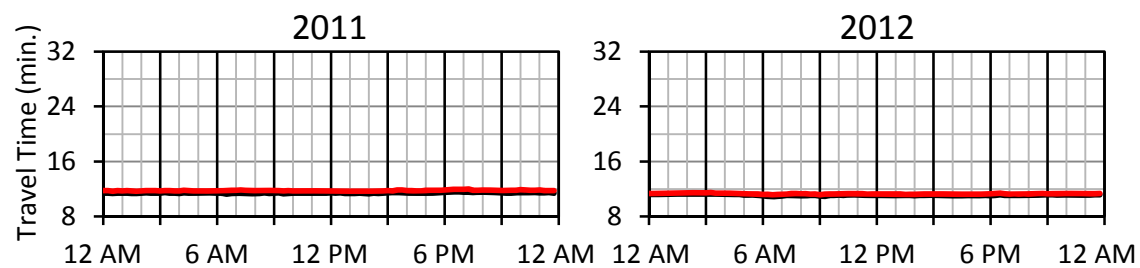
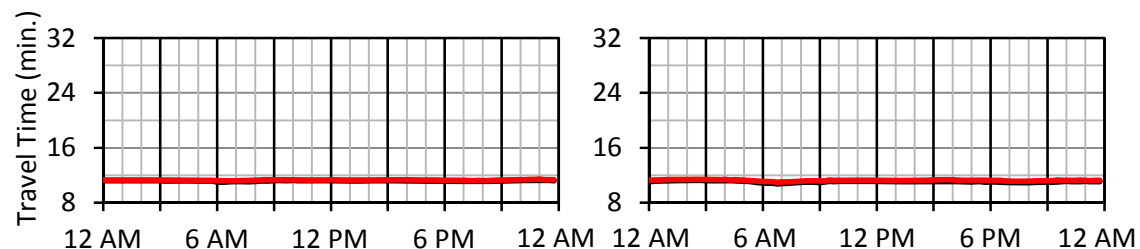
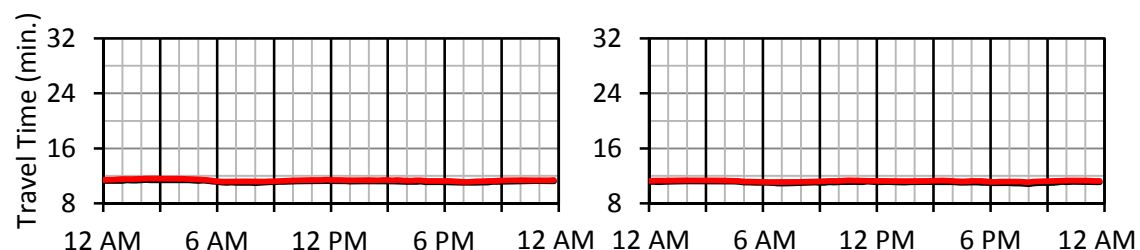
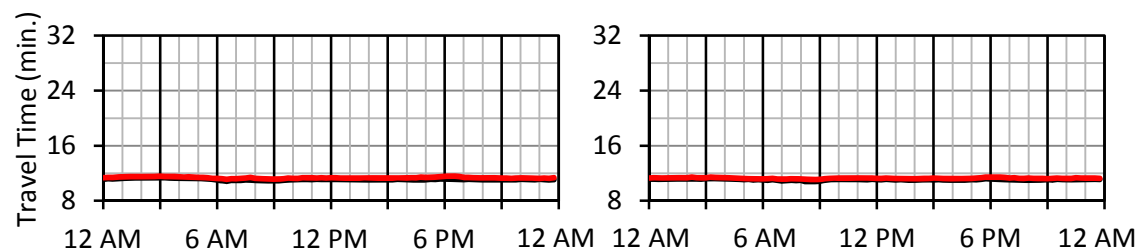
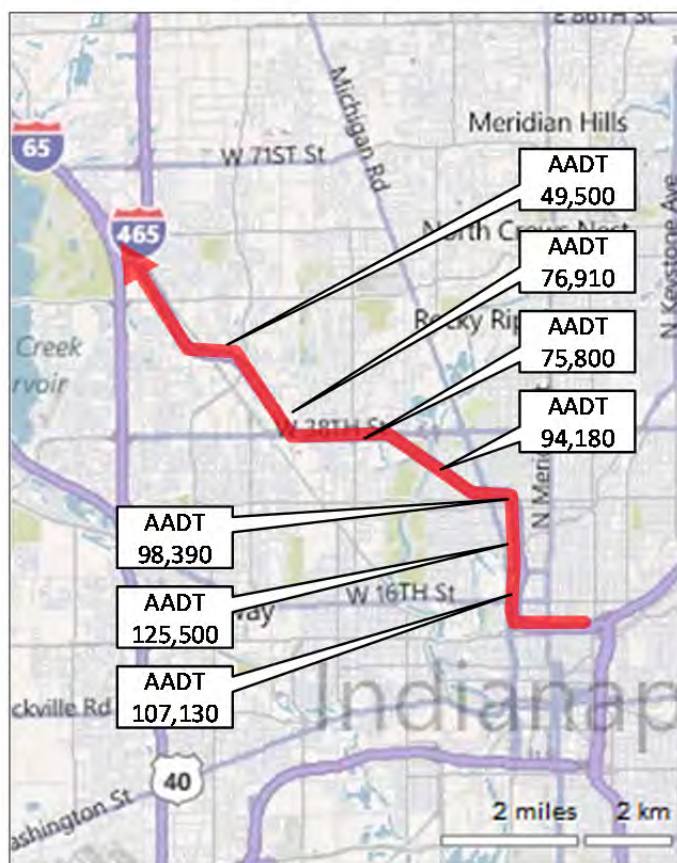
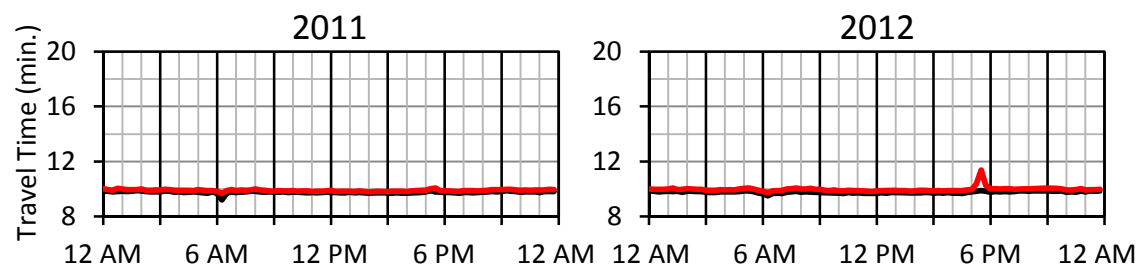
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

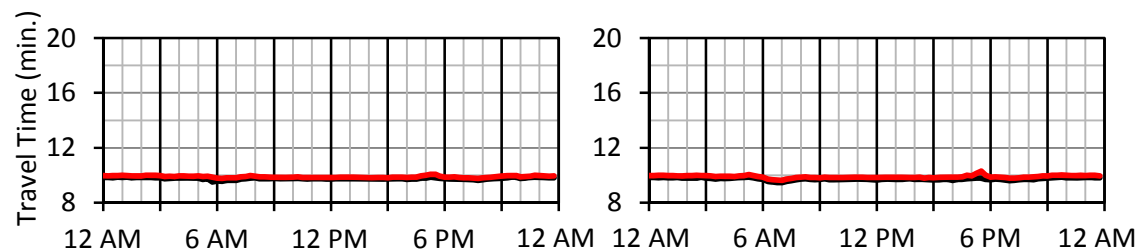
Figure F.8. 2011 &amp; 2012 Eastbound I-80/94 (I-65 to Illinois state line): Quarterly travel time summary.



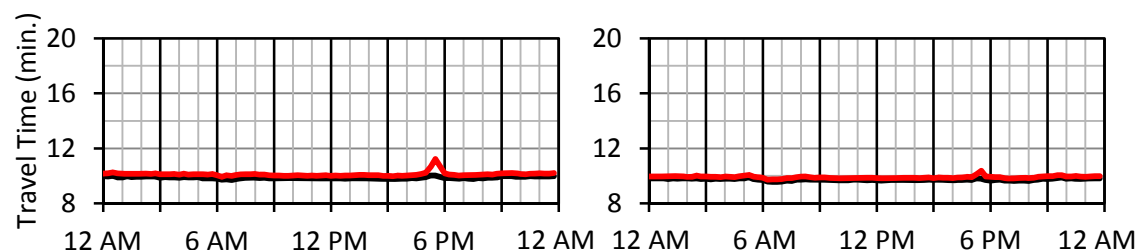
(a) Corridor details



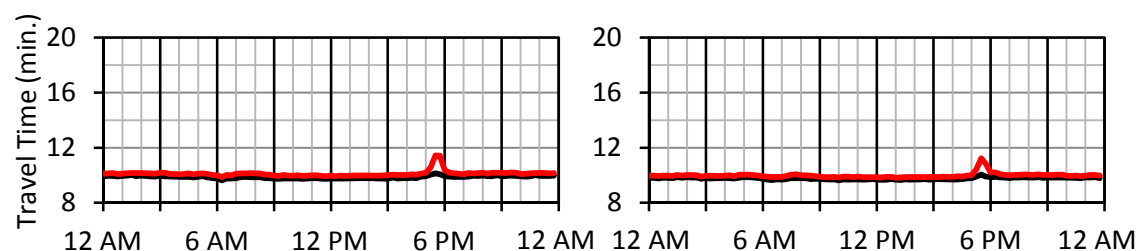
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).



(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

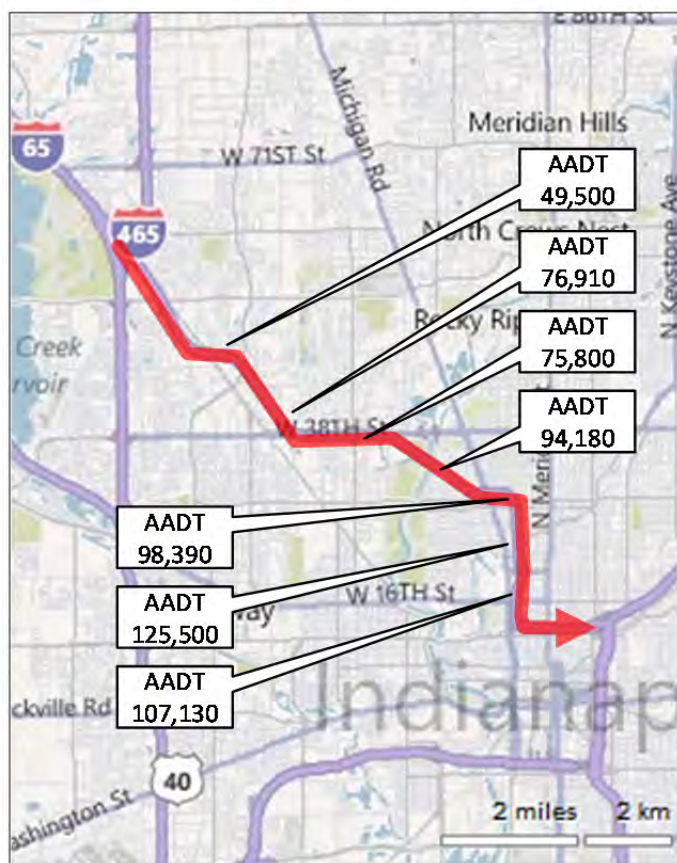


(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).



(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.9. 2011 & 2012 Northbound I-65 (I-465 to I-70): Quarterly travel time summary.



(a) Corridor details

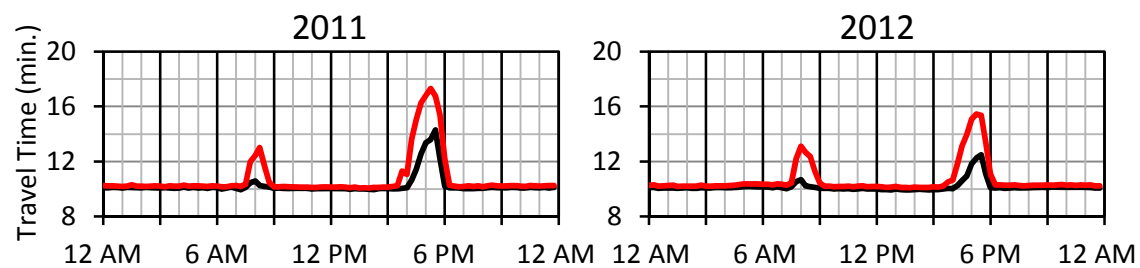
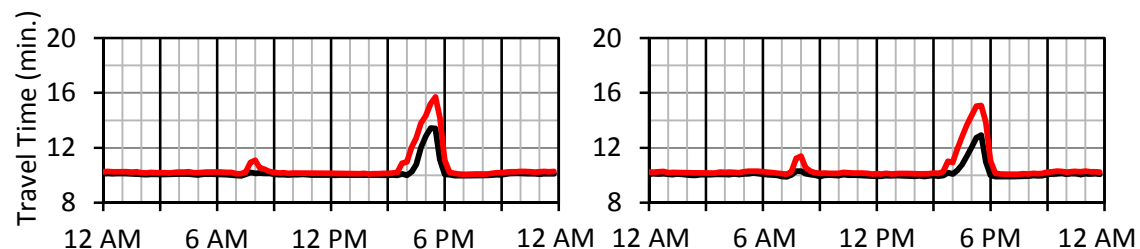
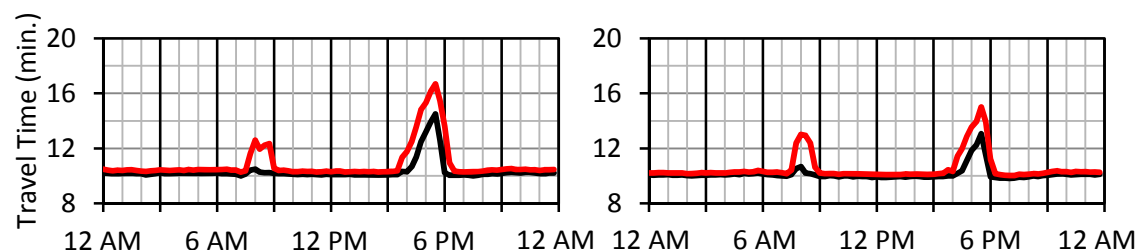
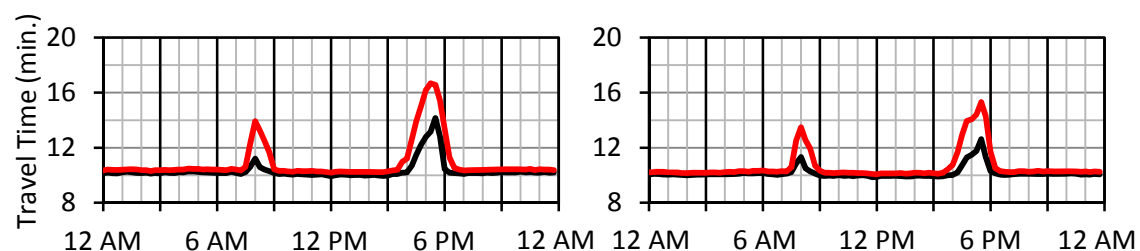
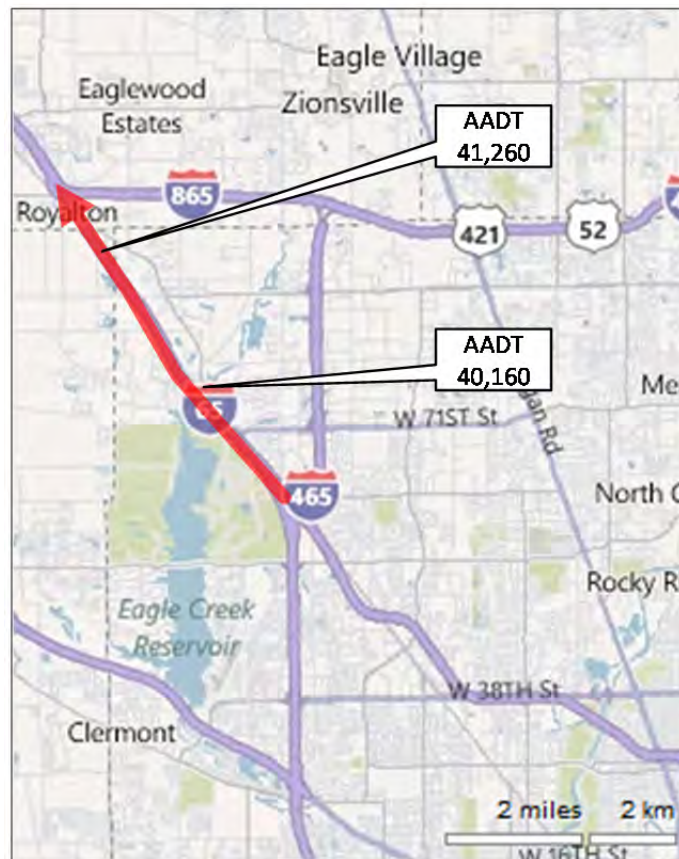
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.10. 2011 &amp; 2012 Southbound I-65 (I-70 to I-465): Quarterly travel time summary.





(a) Corridor details

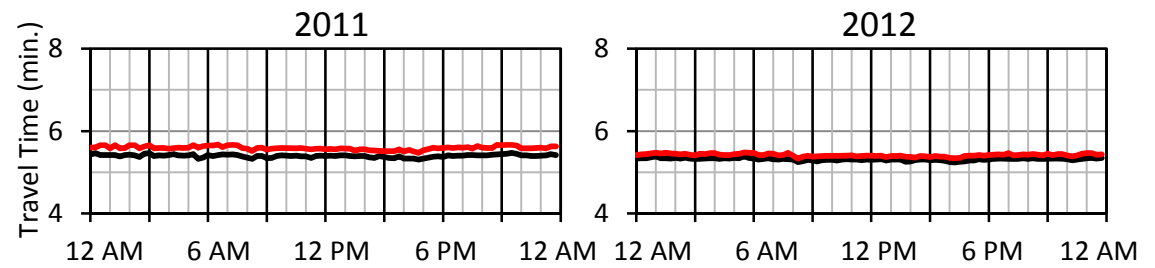
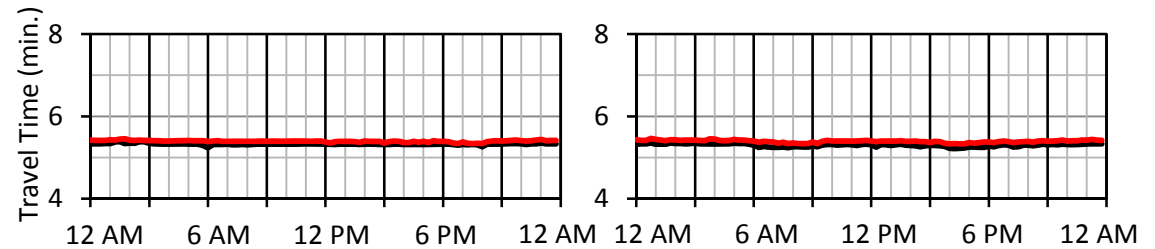
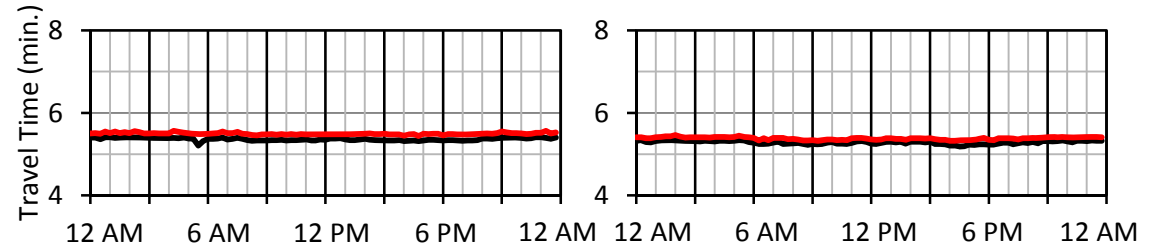
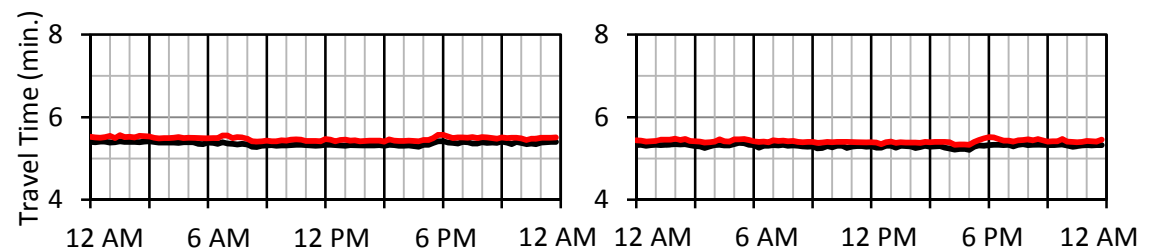
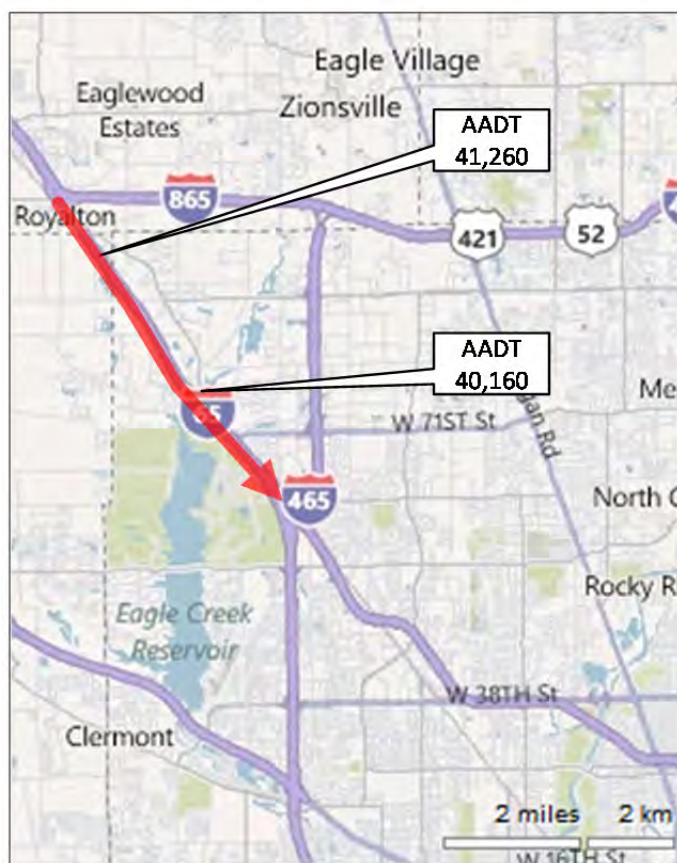
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.11. 2011 &amp; 2012 Northbound I-65 (I-465 to I-865): Quarterly travel time summary.



(a) Corridor details

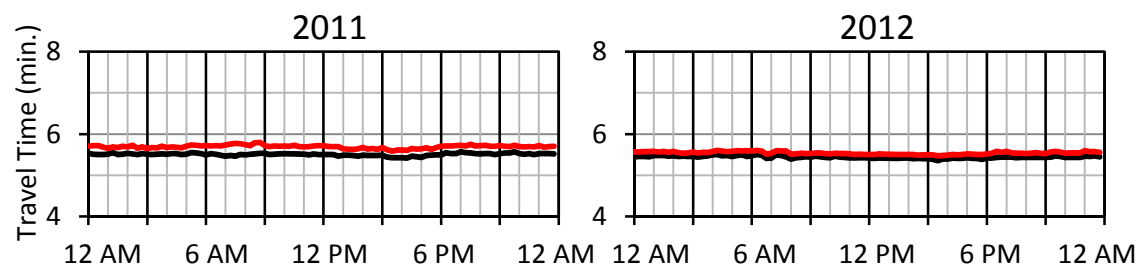
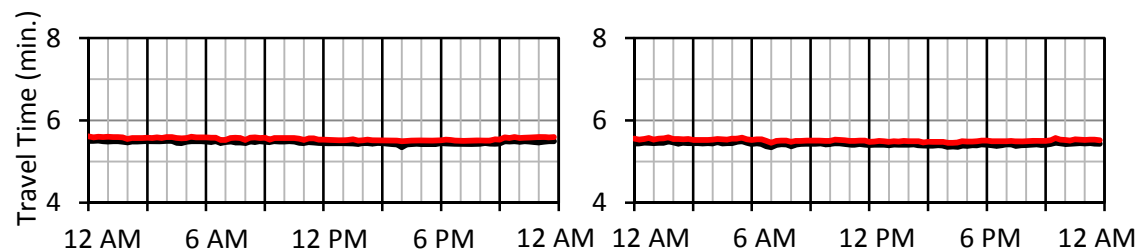
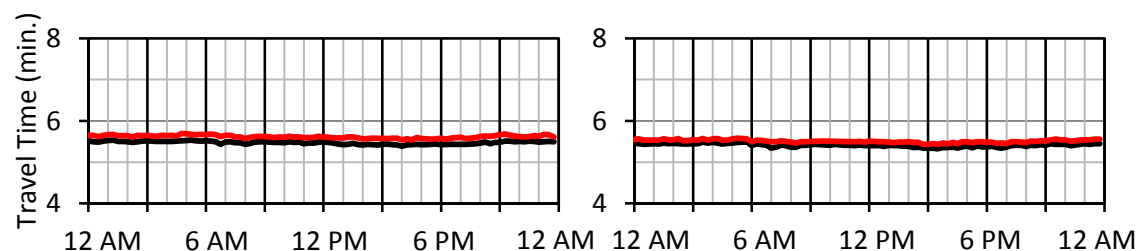
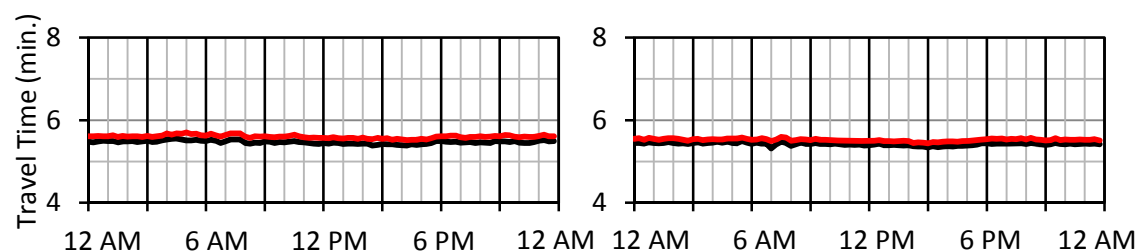
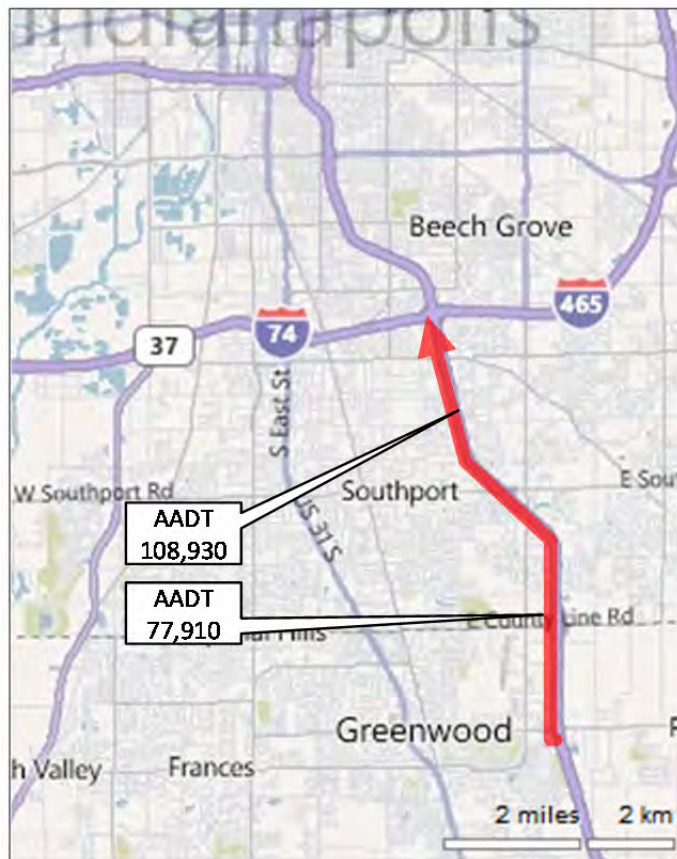
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.12. 2011 &amp; 2012 Southbound I-65 (I-865 to I-465): Quarterly travel time summary.



(a) Corridor details

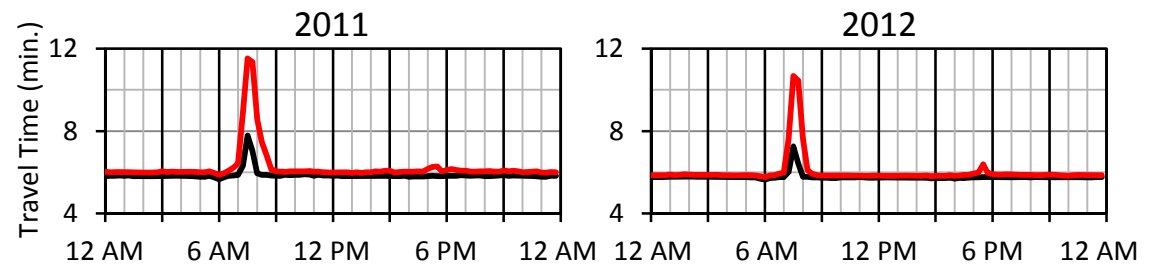
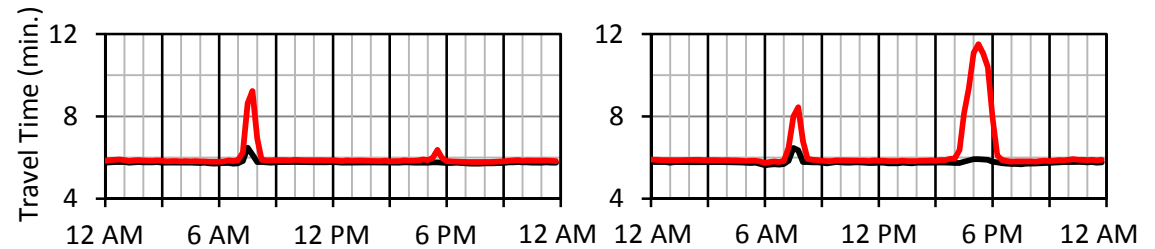
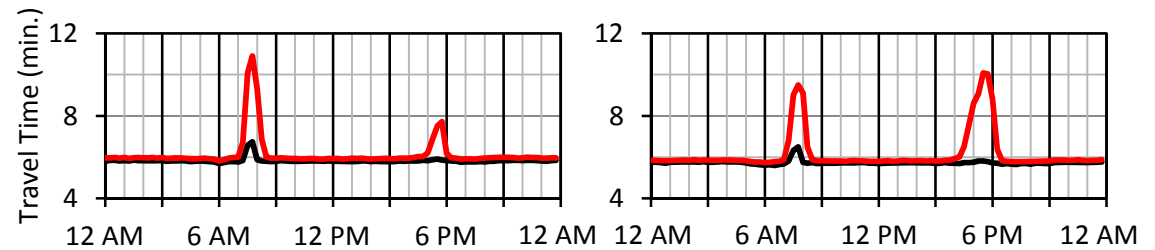
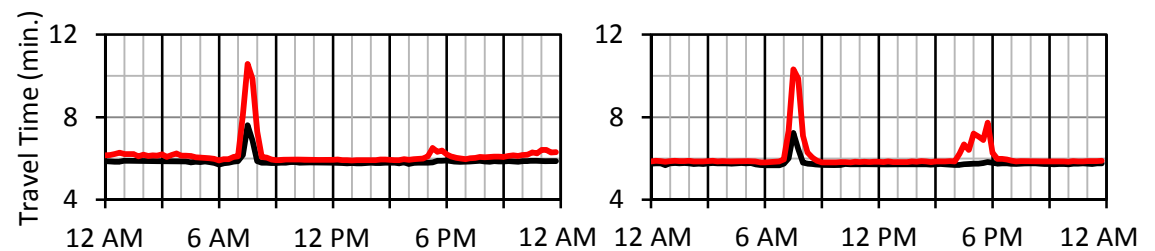
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.13. 2011 &amp; 2012 Northbound I-65 (Greenwood to I-465): Quarterly travel time summary.





(a) Corridor details

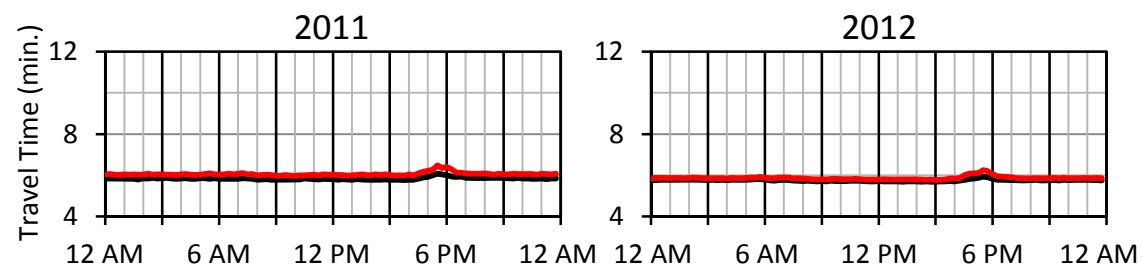
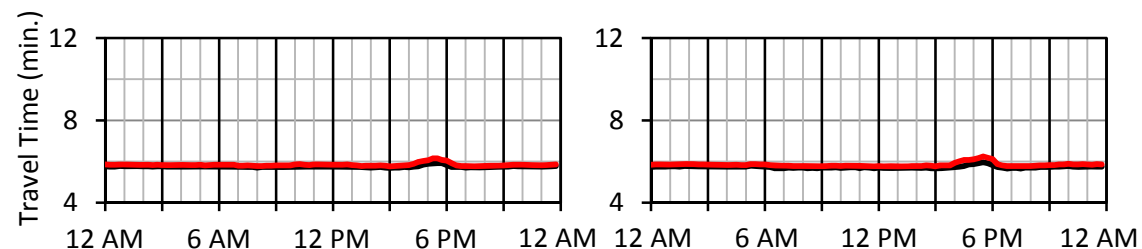
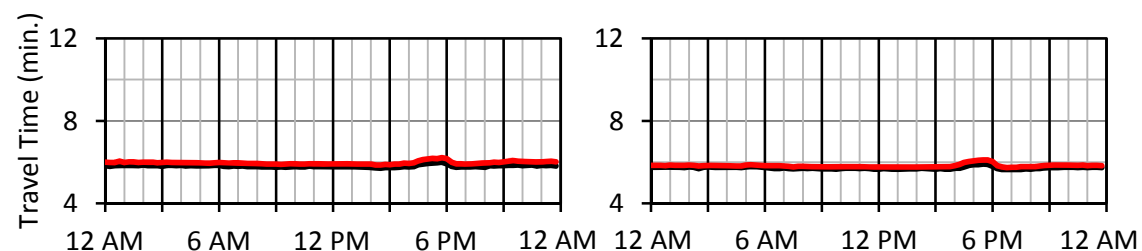
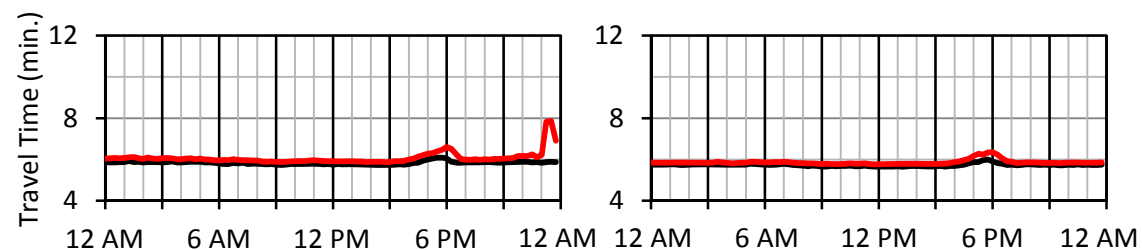
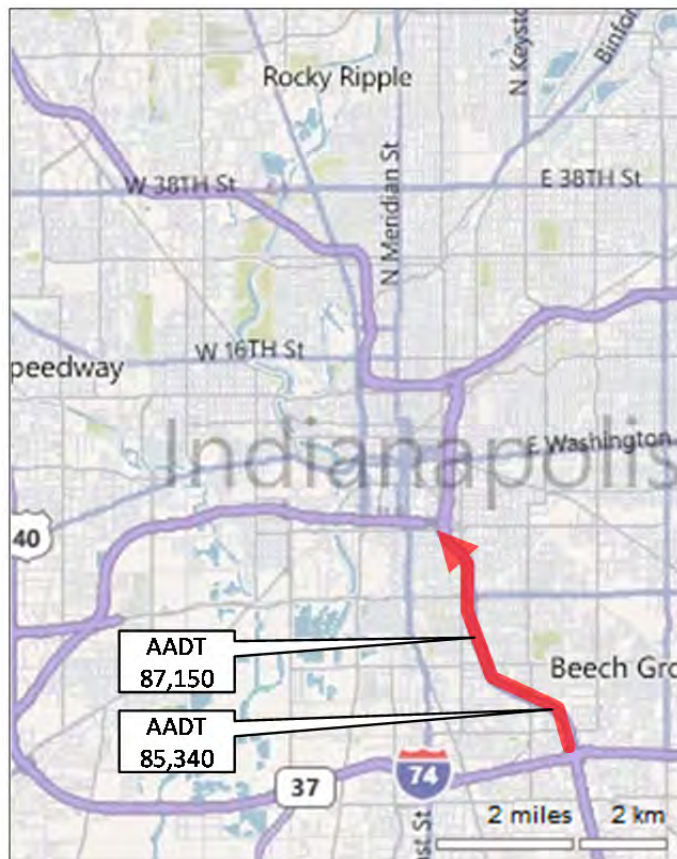
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.14. 2011 &amp; 2012 Southbound I-65 (I-465 to Greenwood): Quarterly travel time summary.



(a) Corridor details

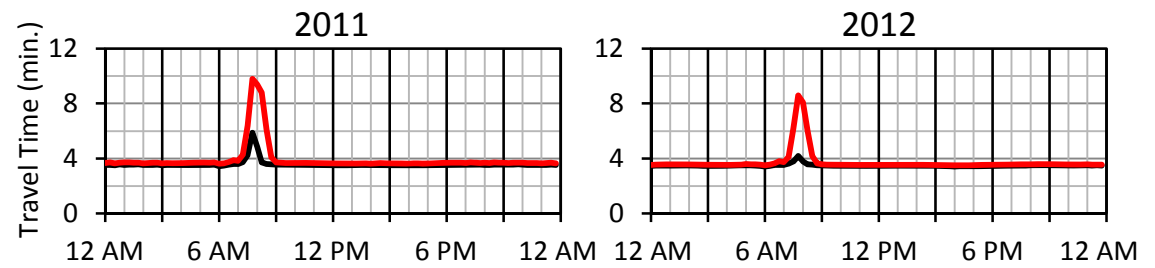
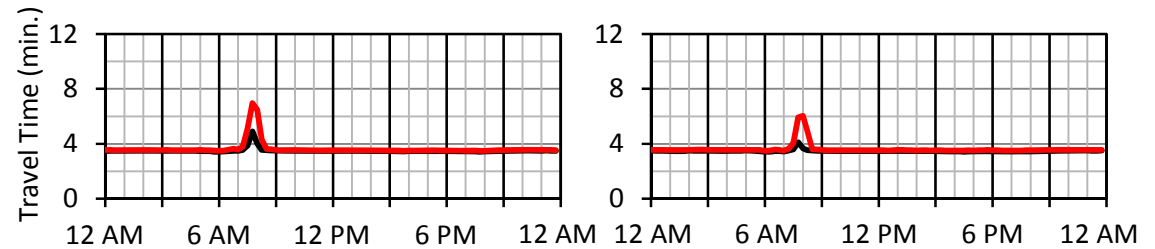
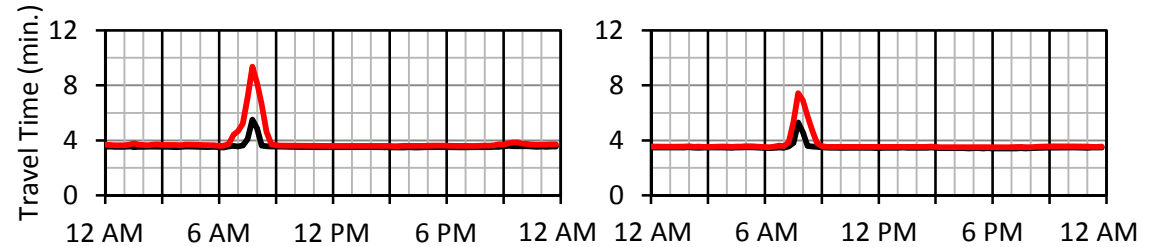
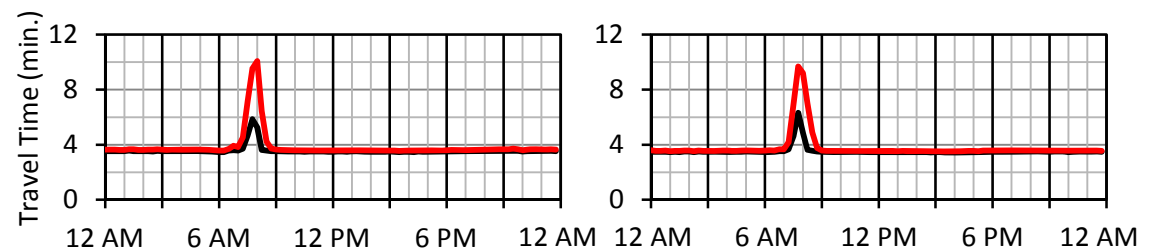
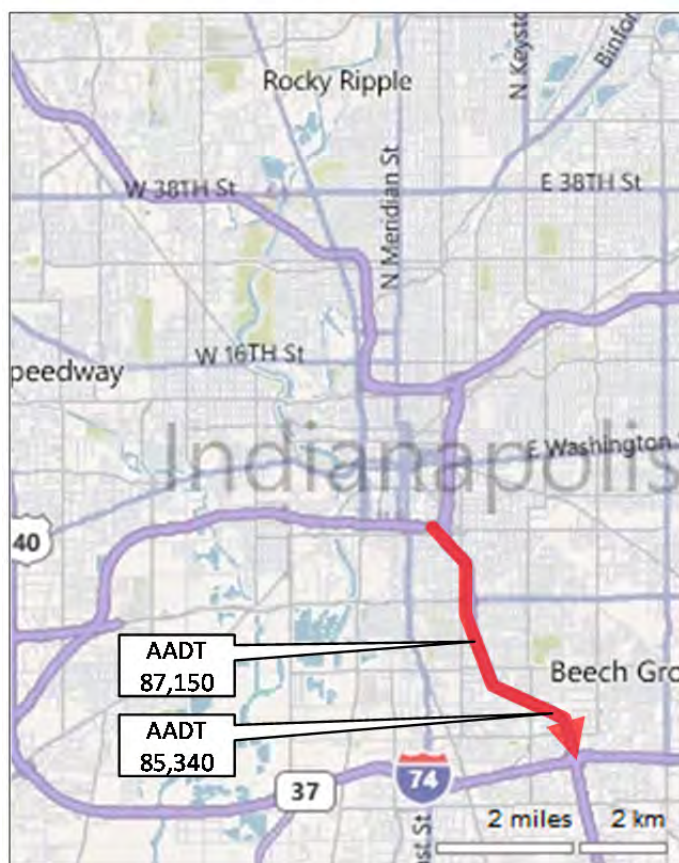
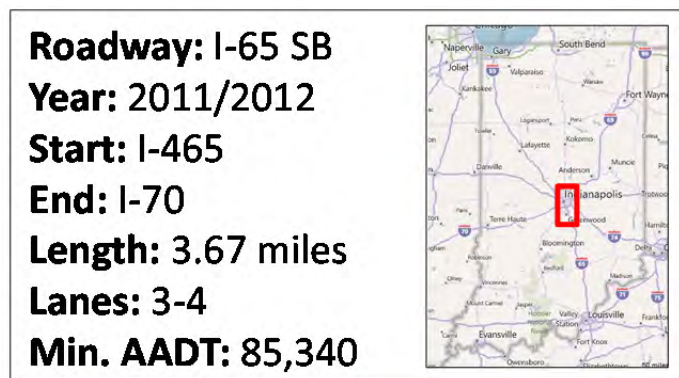
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.15. 2011 &amp; 2012 Northbound I-65 (I-70 to I-465): Quarterly travel time summary.



(a) Corridor details

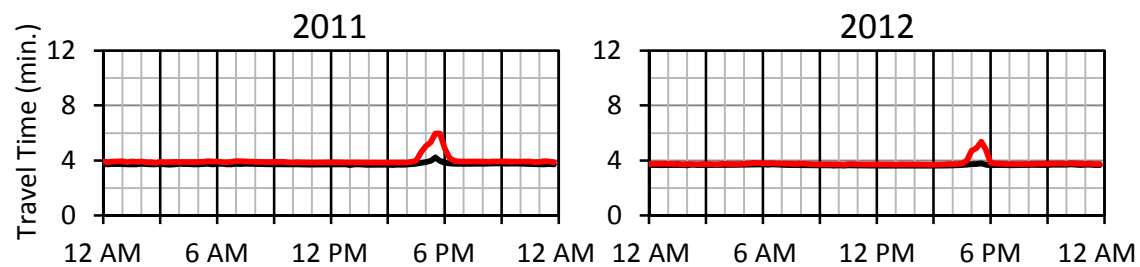
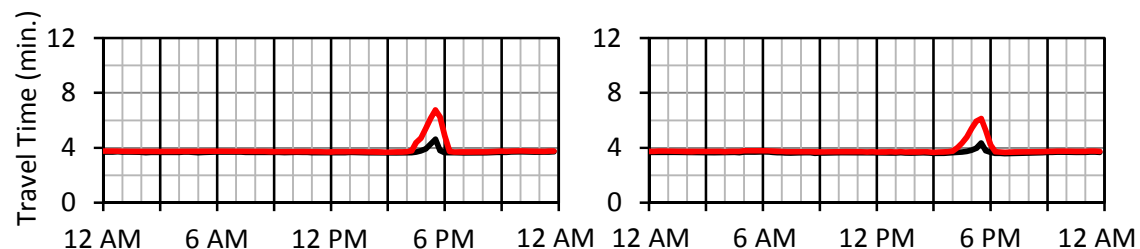
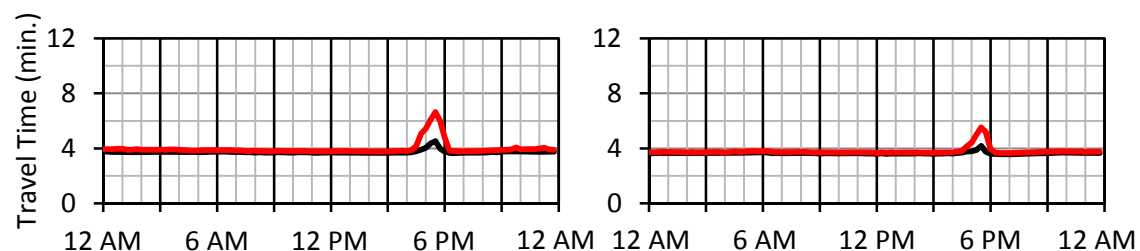
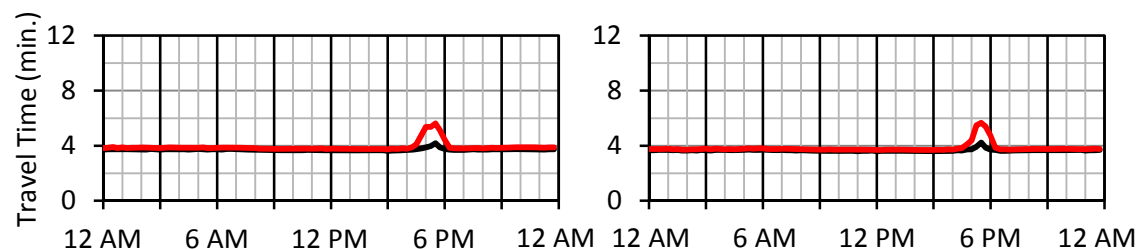
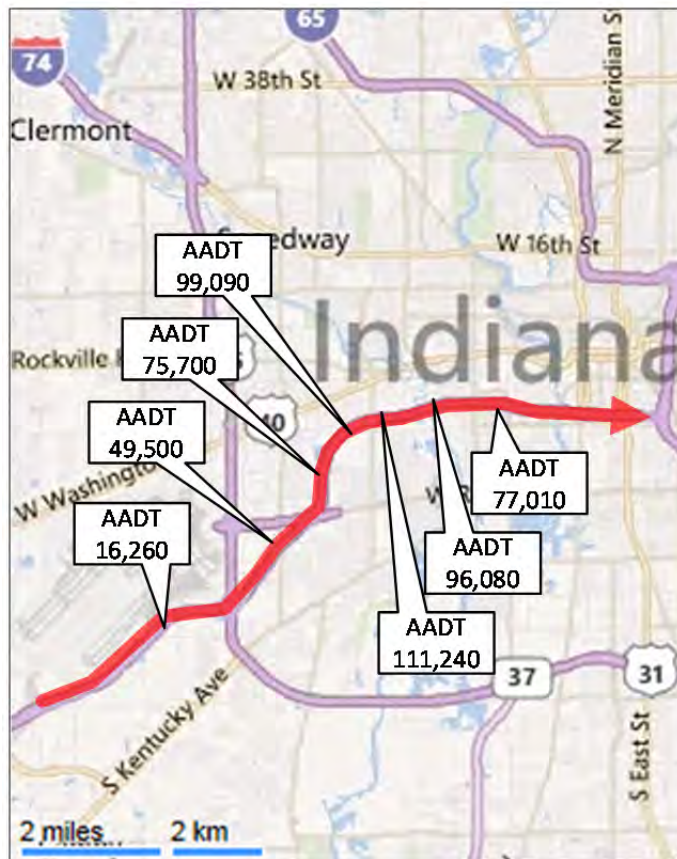
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.16. 2011 &amp; 2012 Southbound I-65 (I-465 to I-70): Quarterly travel time summary.





(a) Corridor details

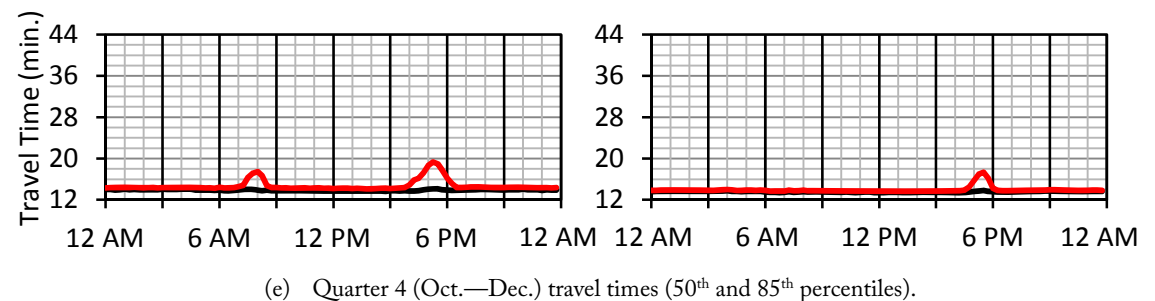
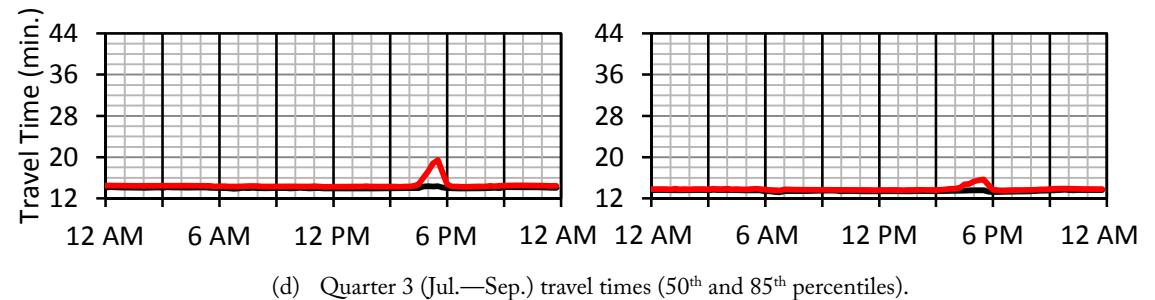
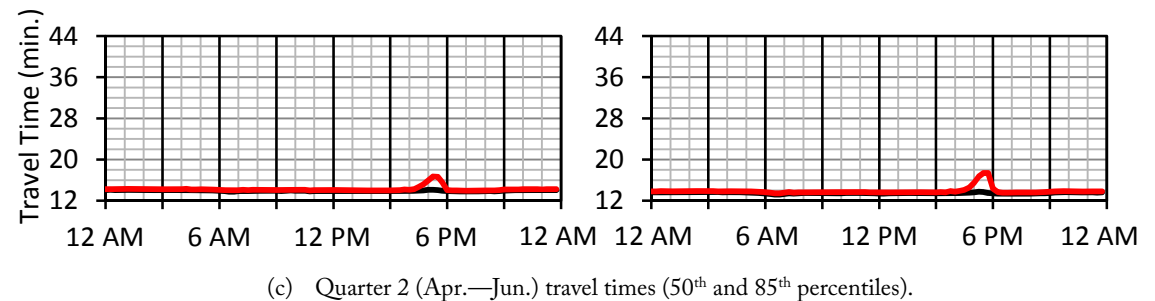
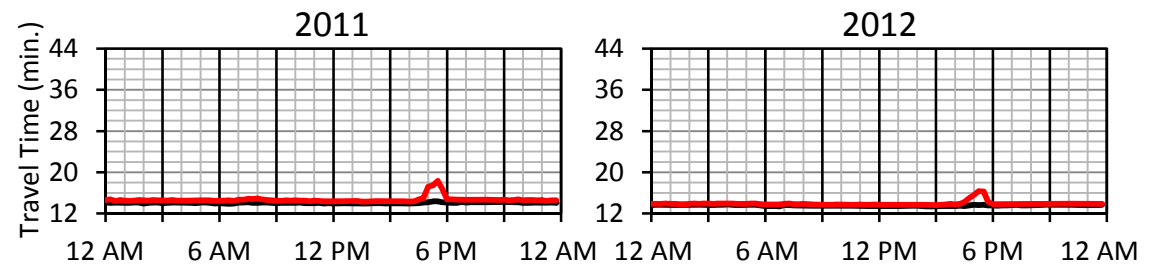
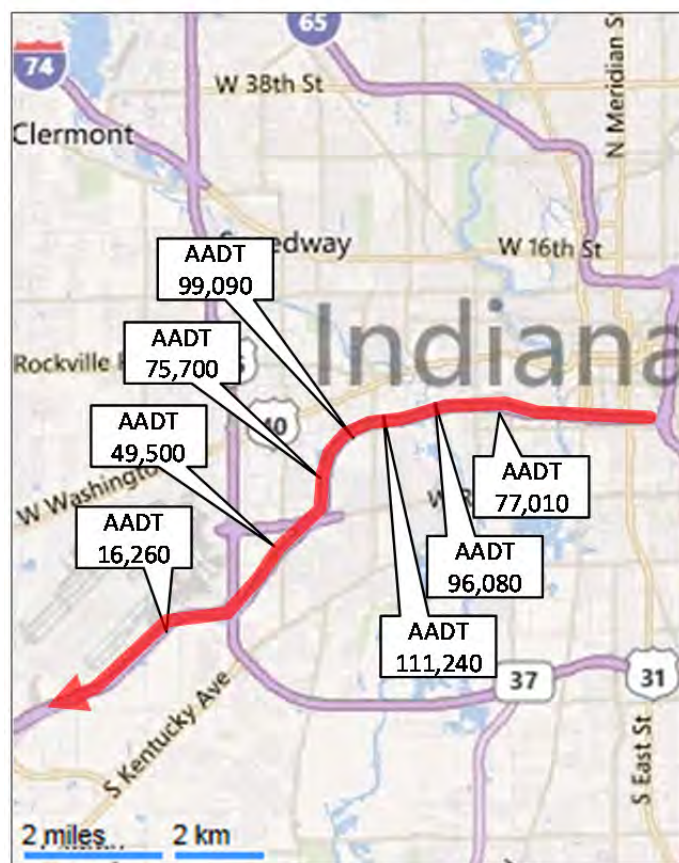


Figure F.17. 2011 &amp; 2012 Eastbound I-70 (airport to I-65): Quarterly travel time summary.



(a) Corridor details

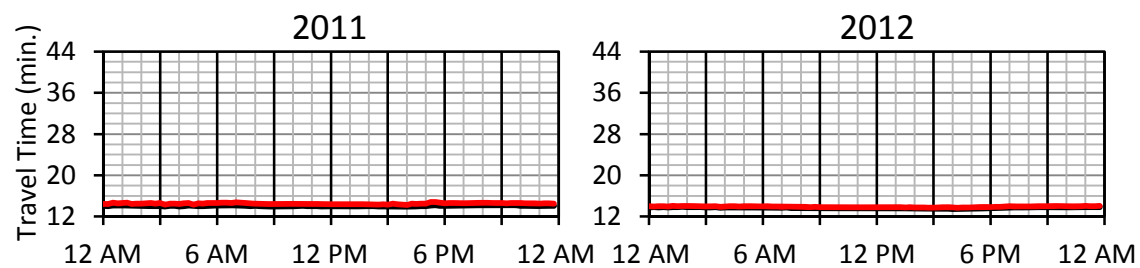
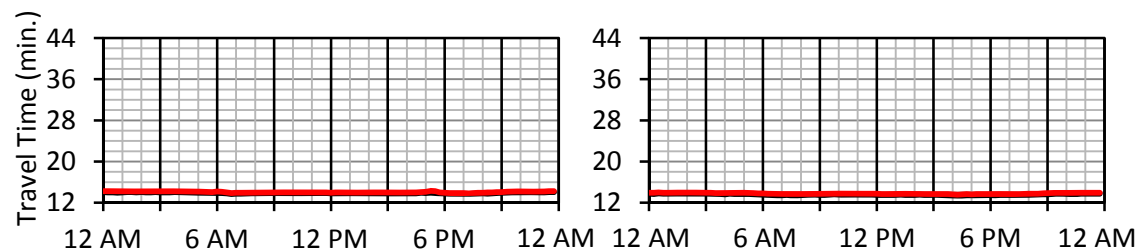
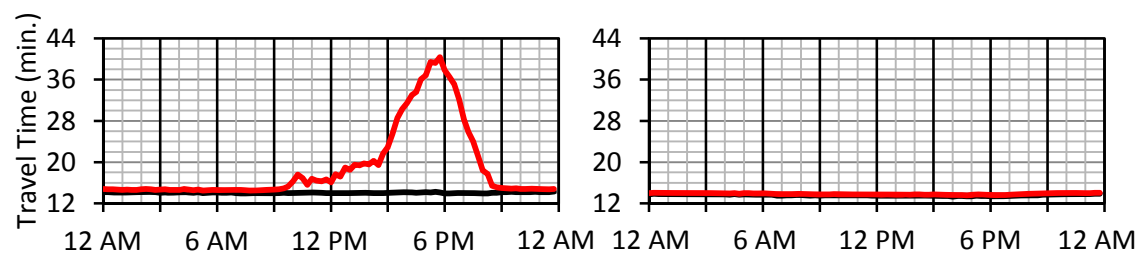
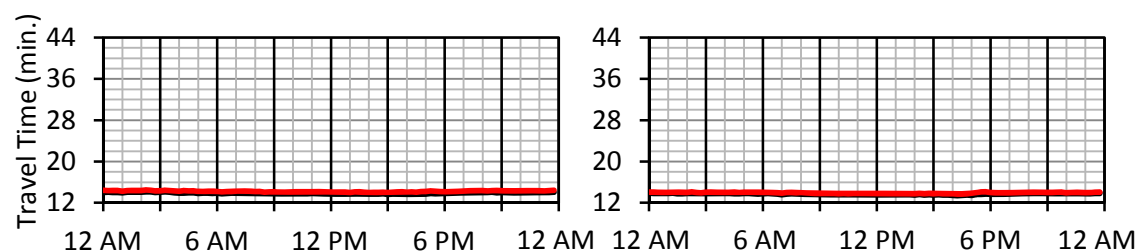
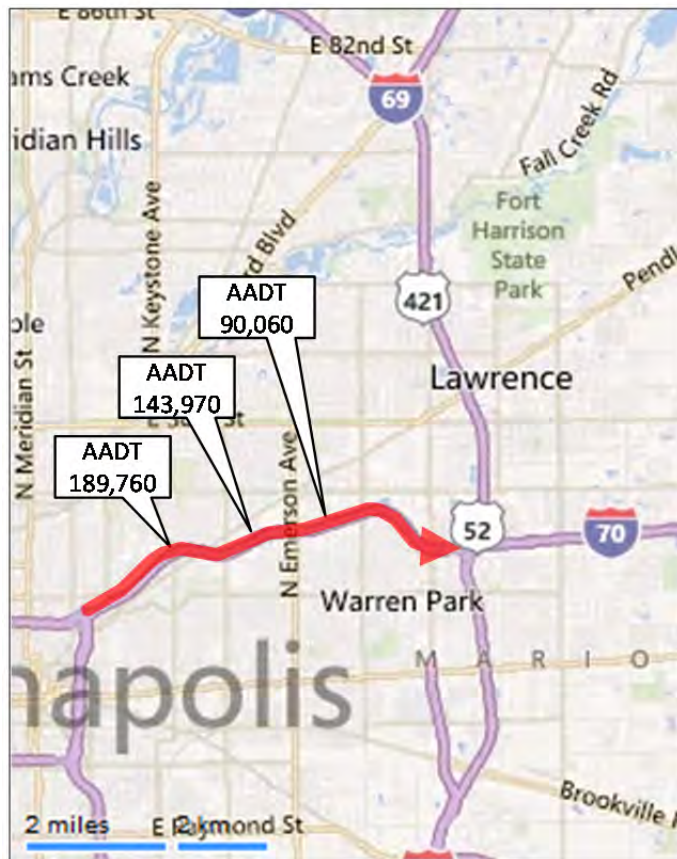
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.18. 2011 &amp; 2012 Westbound I-70 (I-65 to airport): Quarterly travel time summary.



(a) Corridor details

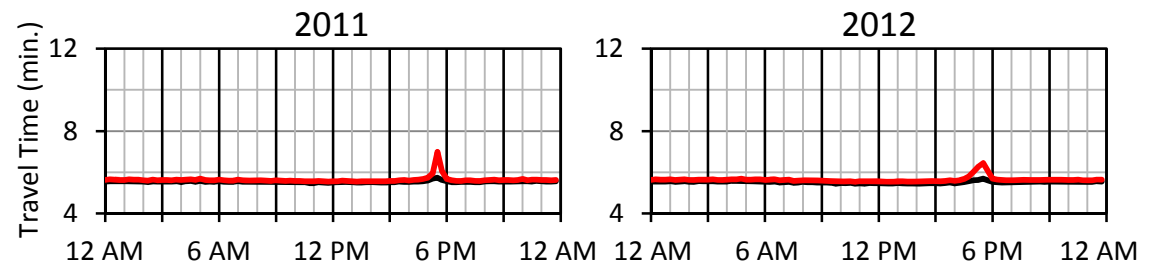
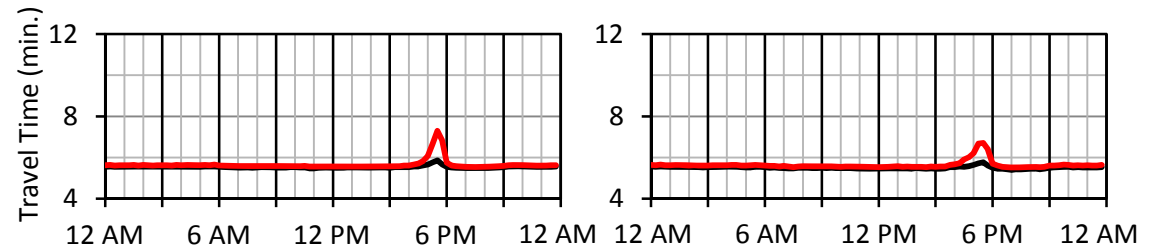
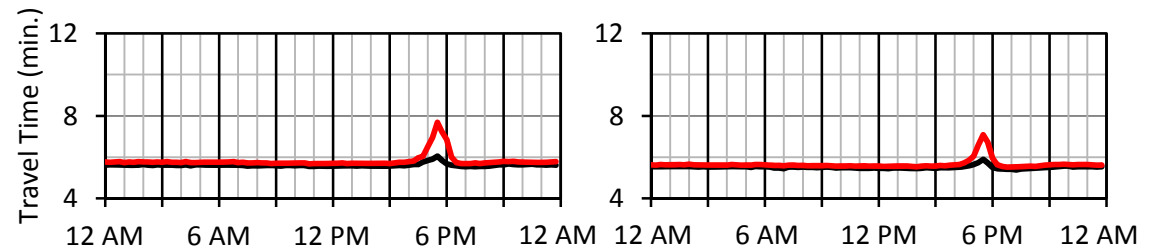
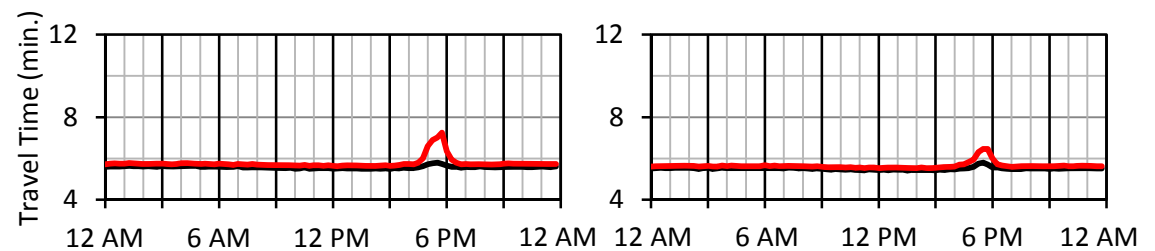
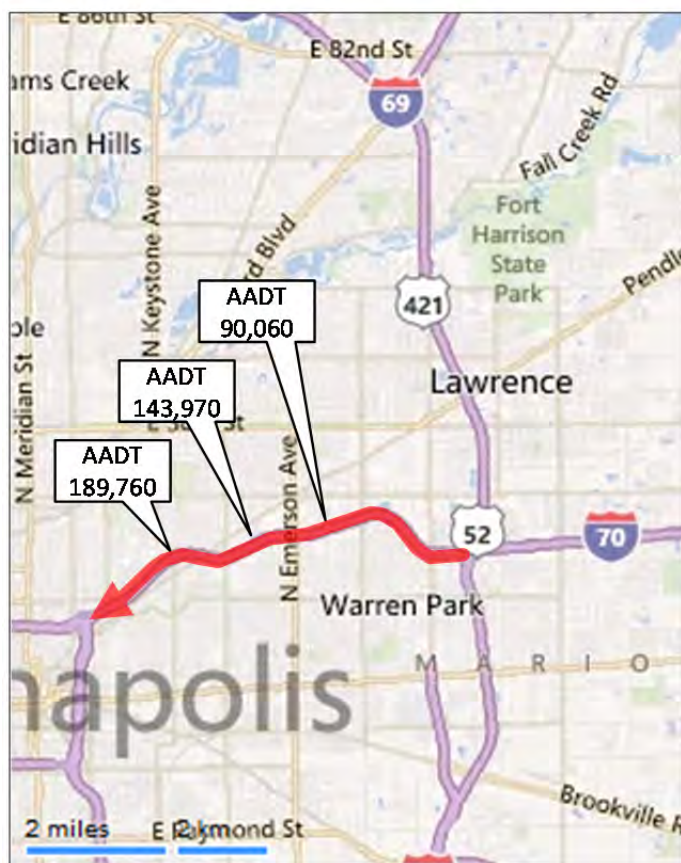
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.19. 2011 &amp; 2012 Eastbound I-70 (I-65 to I-465): Quarterly travel time summary.





(a) Corridor details

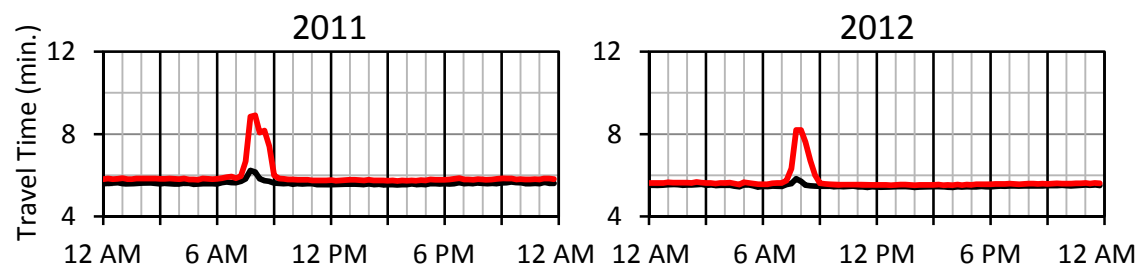
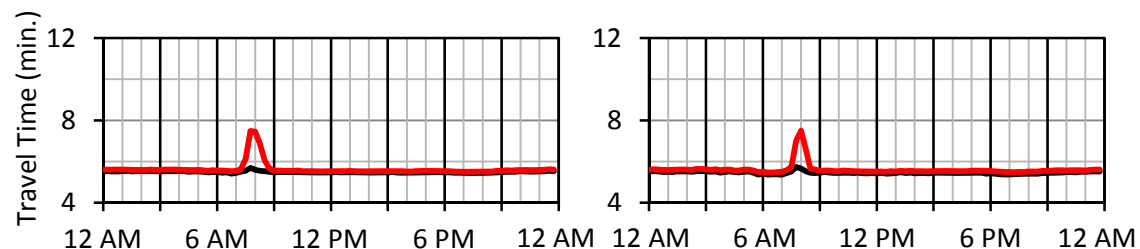
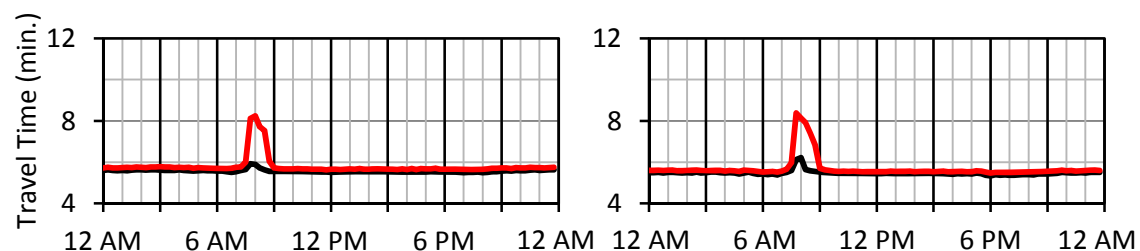
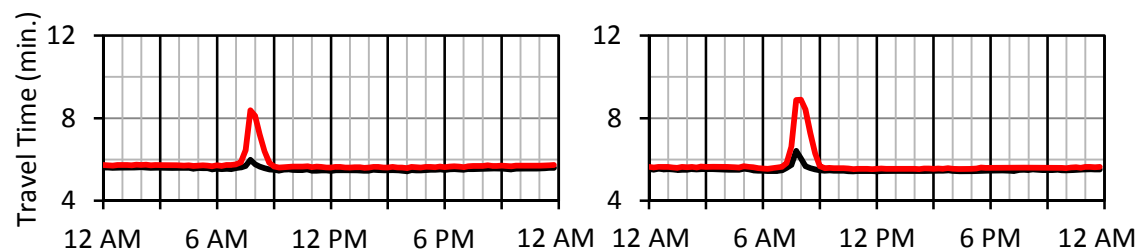
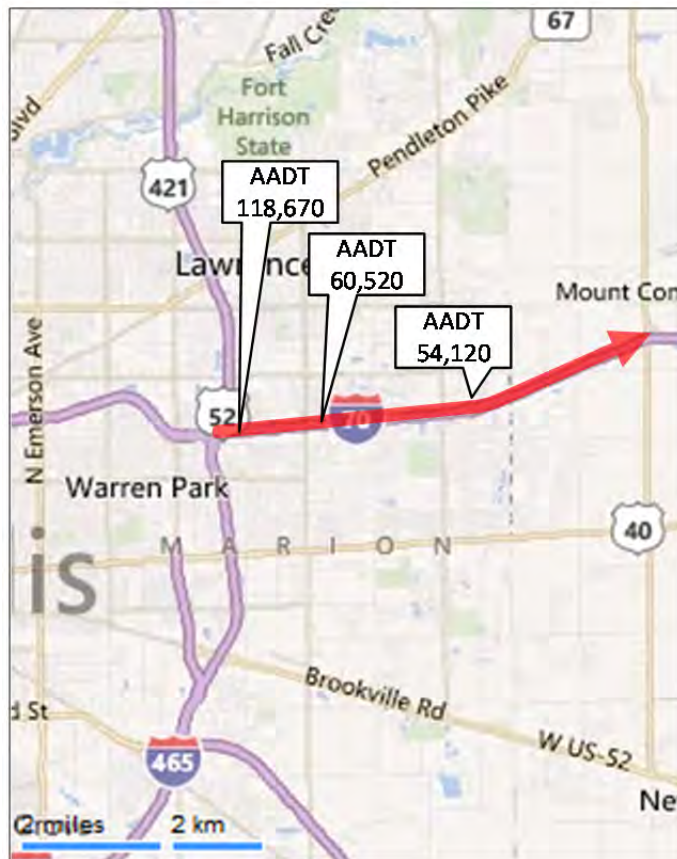
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.20. 2011 &amp; 2012 Westbound I-70 (I-465 to I-65): Quarterly travel time summary.



(a) Corridor details

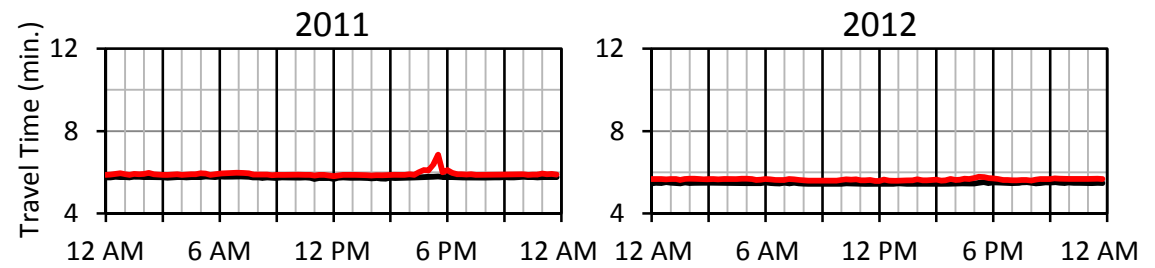
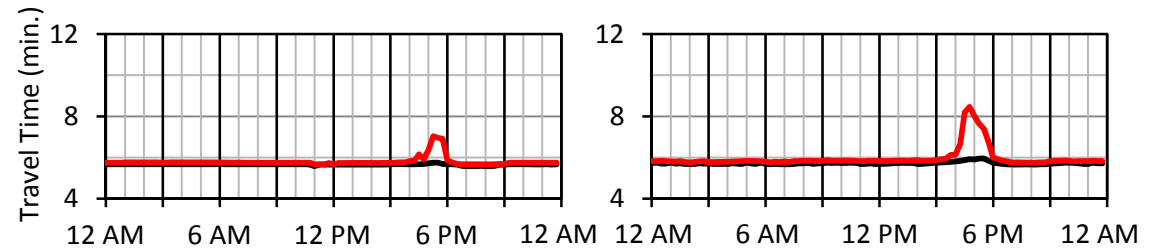
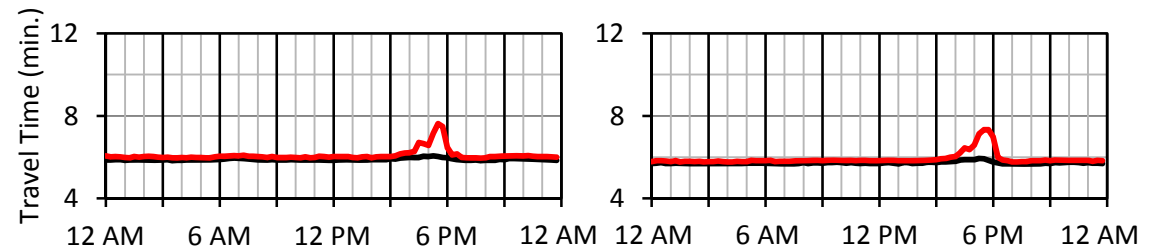
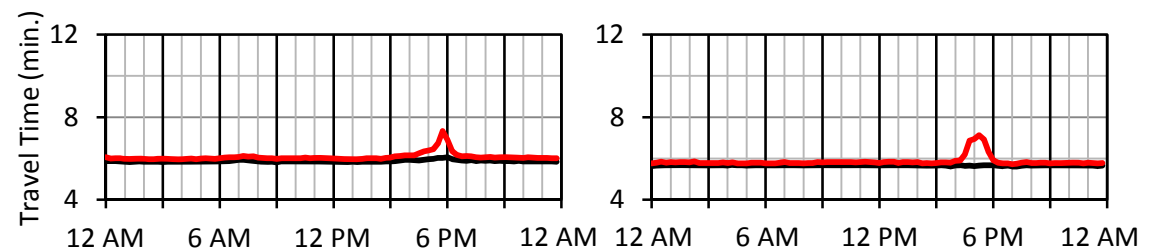
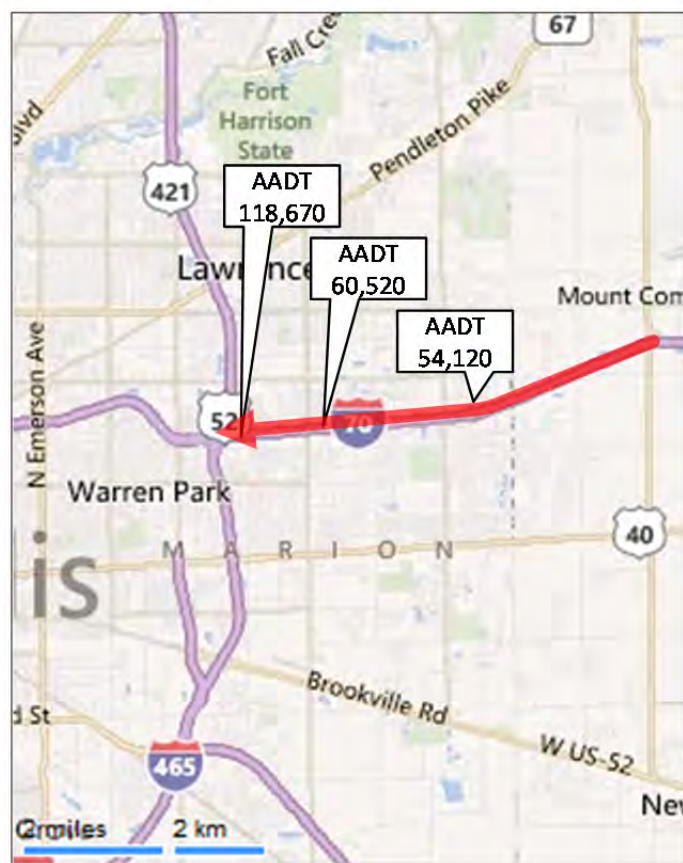
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.21. 2011 &amp; 2012 Eastbound I-70 (I-465 to Mt. Comfort): Quarterly travel time summary.

**Roadway:** I-70 WB  
**Year:** 2011/2012  
**Start:** Mt. Comfort  
**End:** I-465  
**Length:** 5.75 miles  
**Lanes:** 2-4  
**Min. AADT:** 54,120



(a) Corridor details

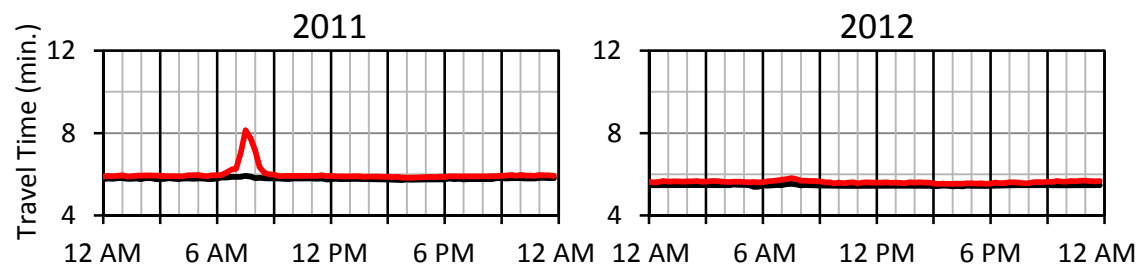
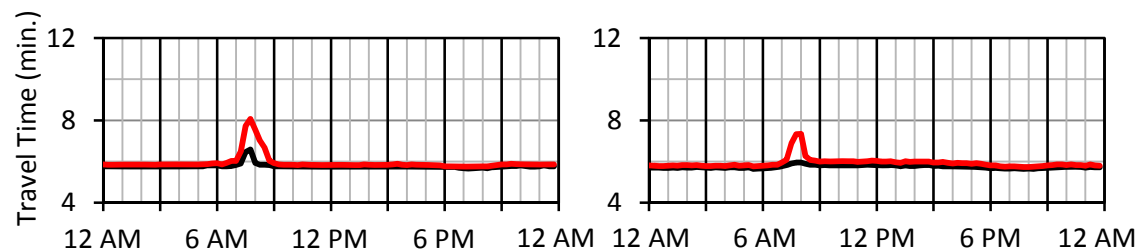
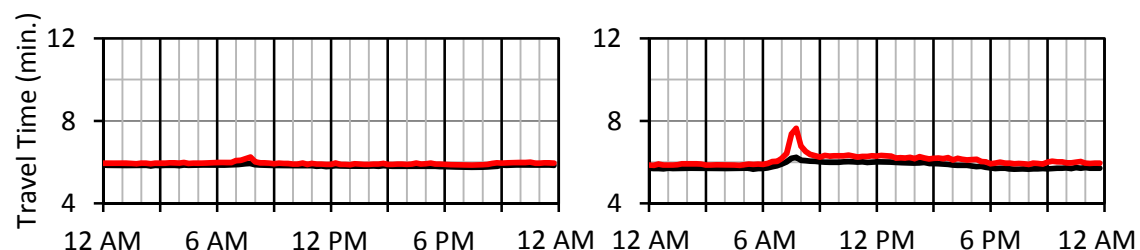
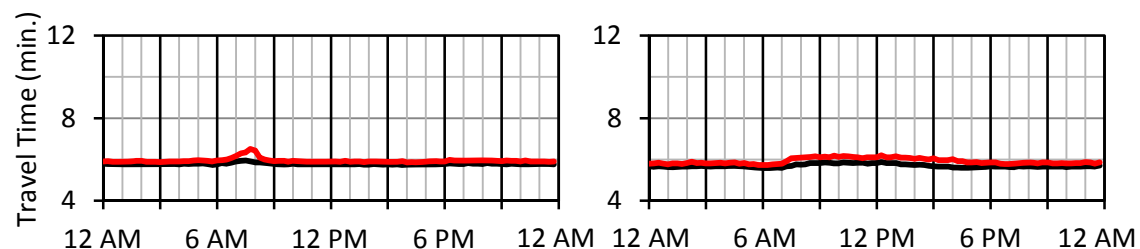
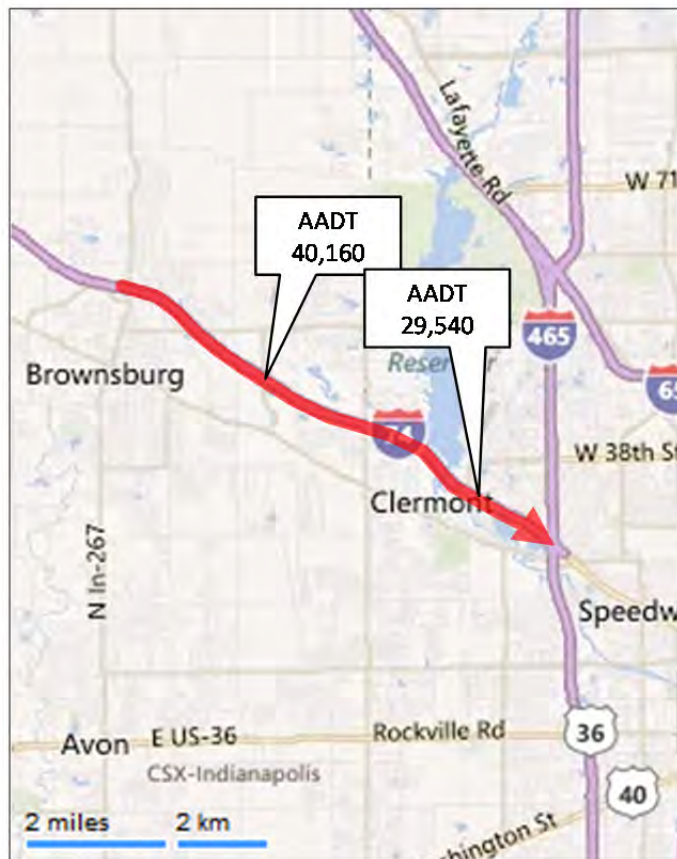
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.22. 2011 &amp; 2012 Westbound I-70 (Mt. Comfort to I-465): Quarterly travel time summary.





(a) Corridor details

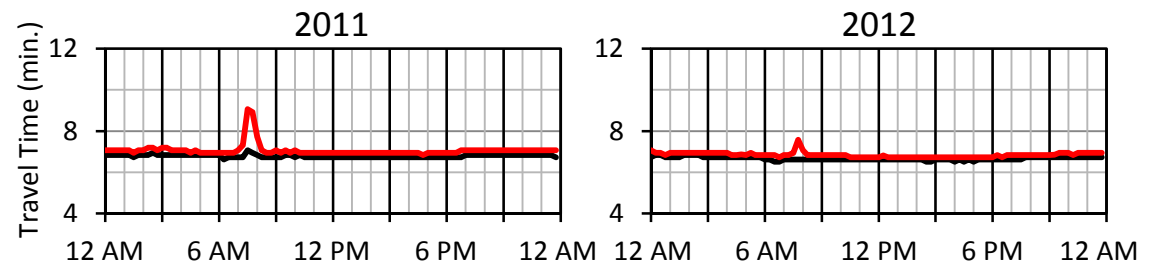
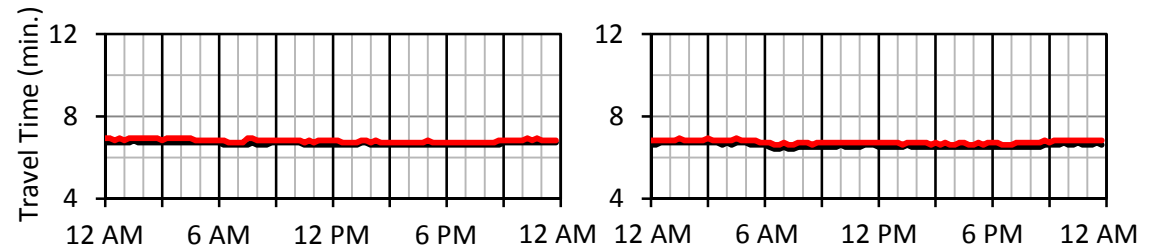
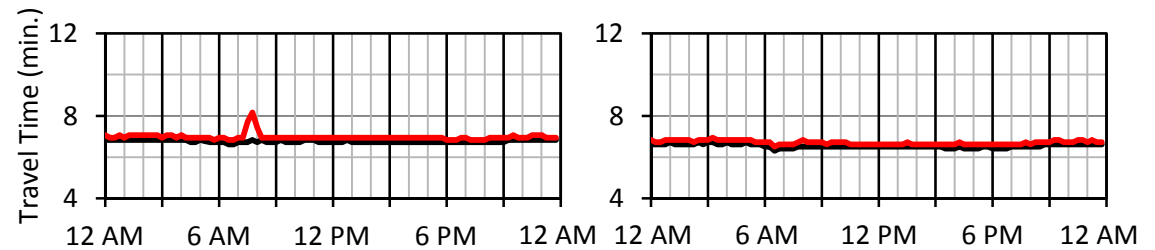
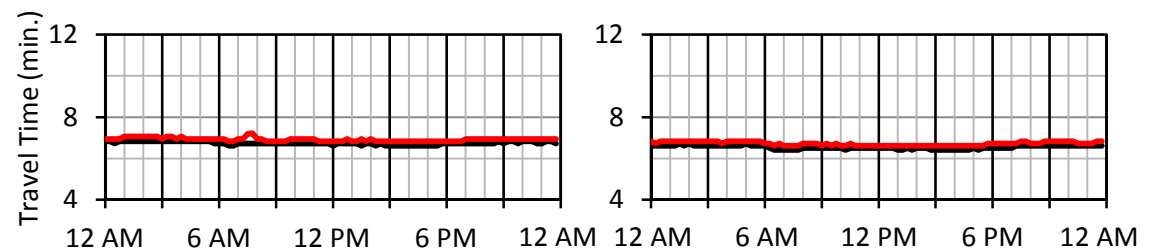
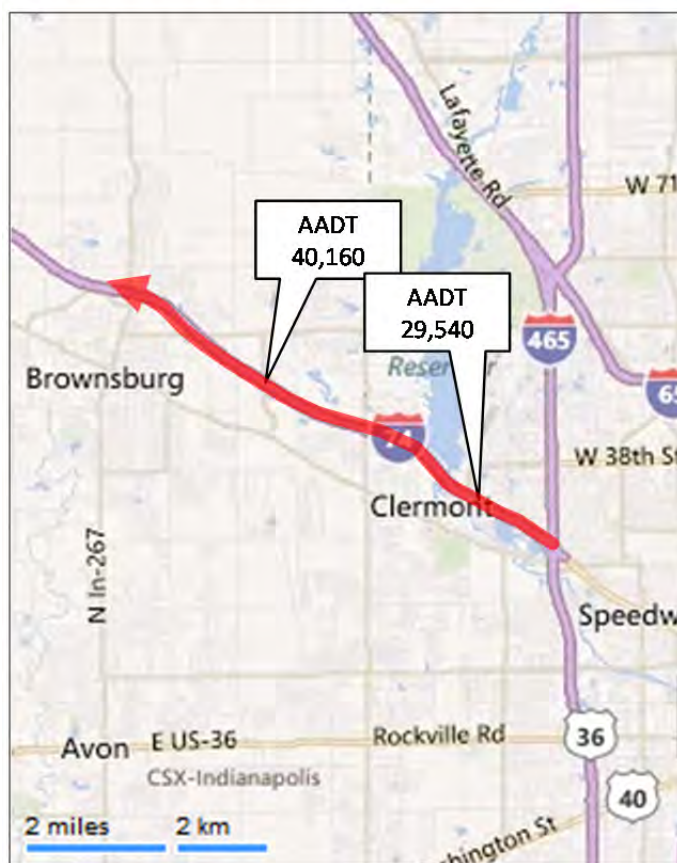
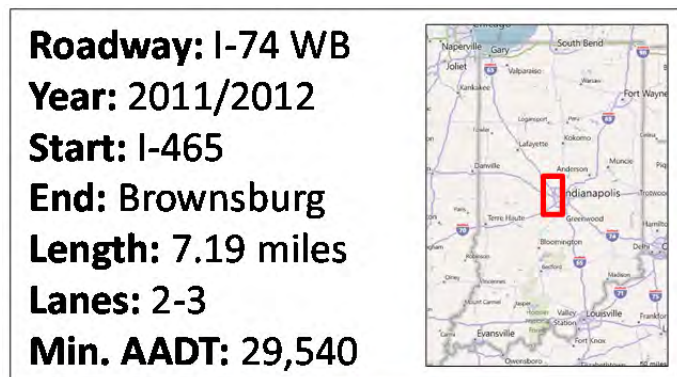
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.23. 2011 &amp; 2012 Eastbound I-74 (Brownsburg to I-465): Quarterly travel time summary.



(a) Corridor details

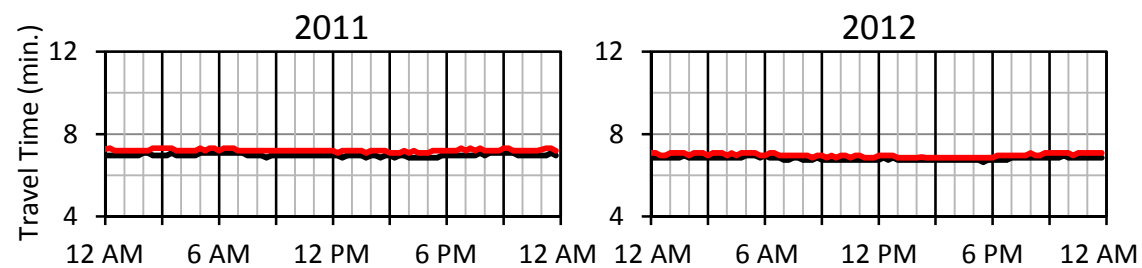
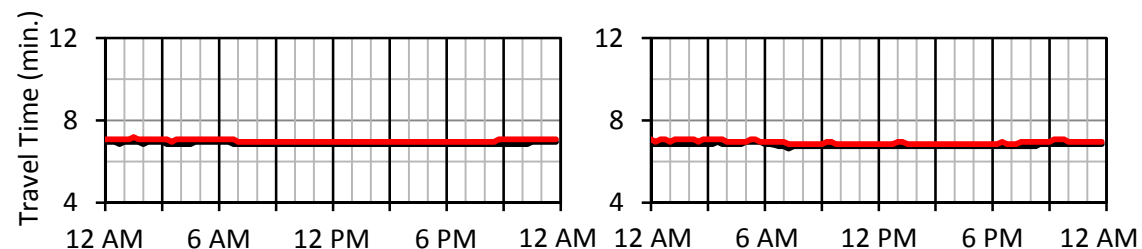
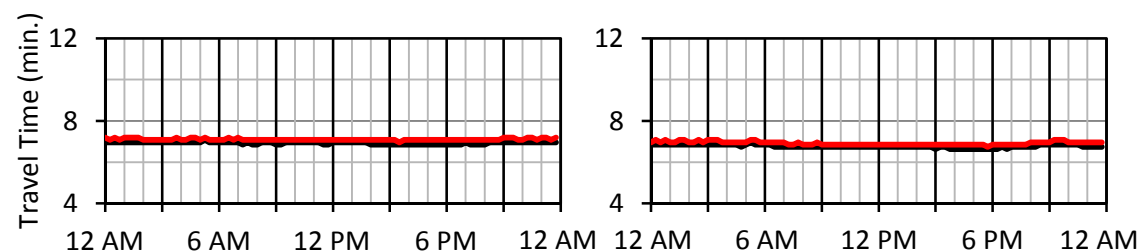
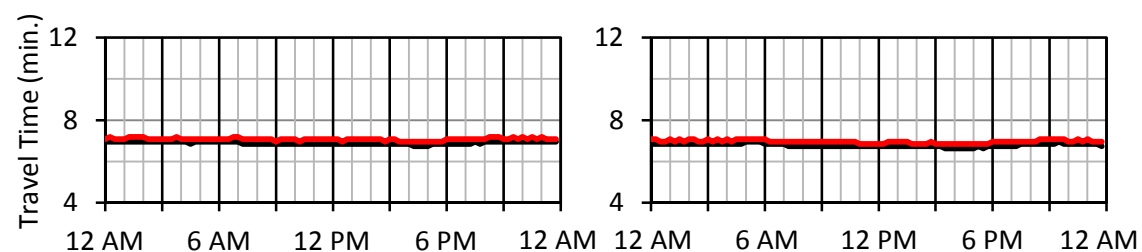
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.24. 2011 &amp; 2012 Westbound I-74 (I-465 to Brownsburg): Quarterly travel time summary.



(a) Corridor details

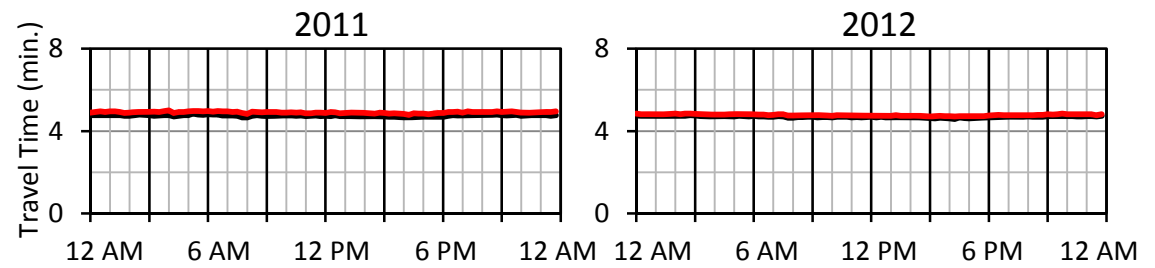
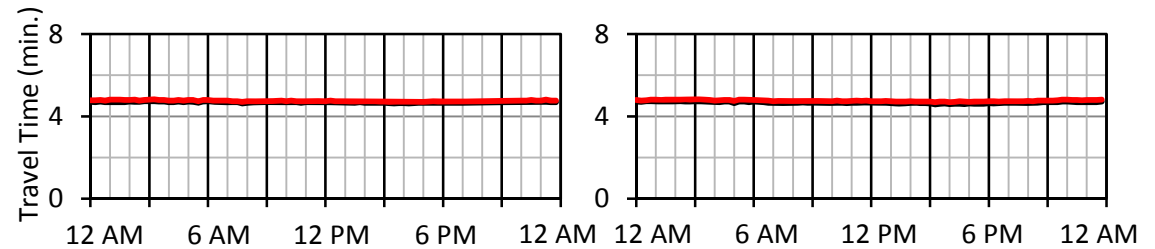
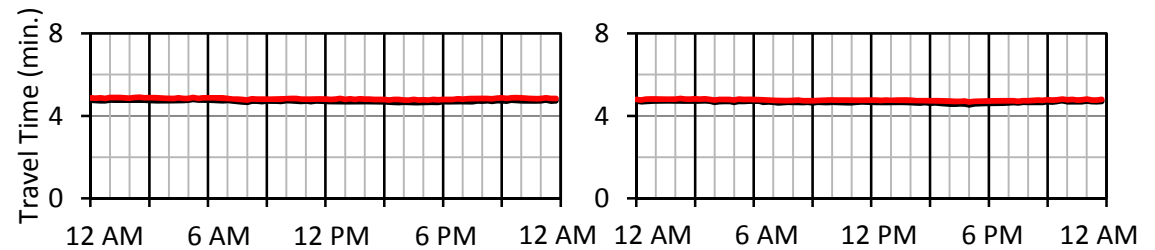
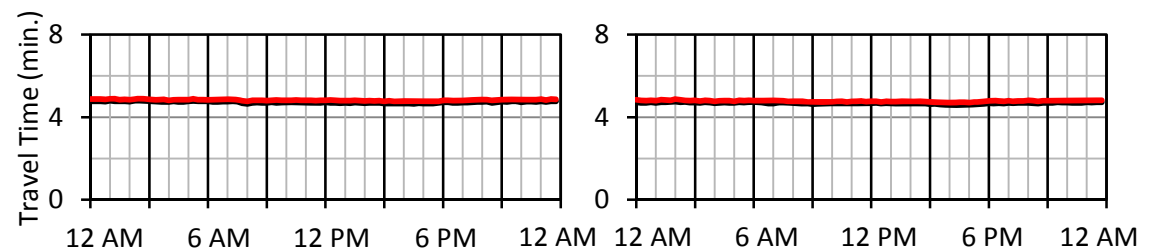
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.25. 2011 &amp; 2012 Eastbound I-74 (I-465 to Acton Rd.): Quarterly travel time summary.





(a) Corridor details

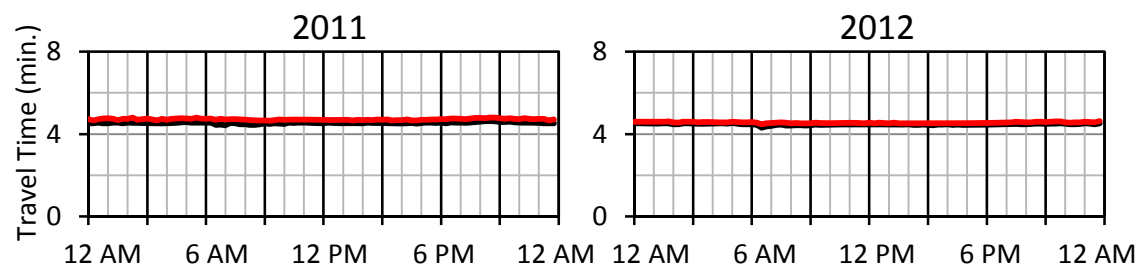
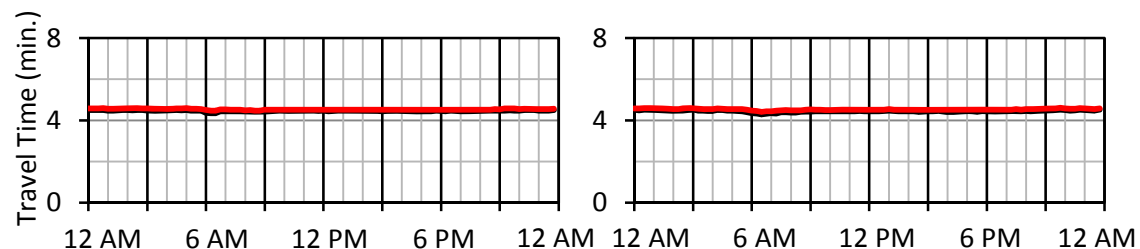
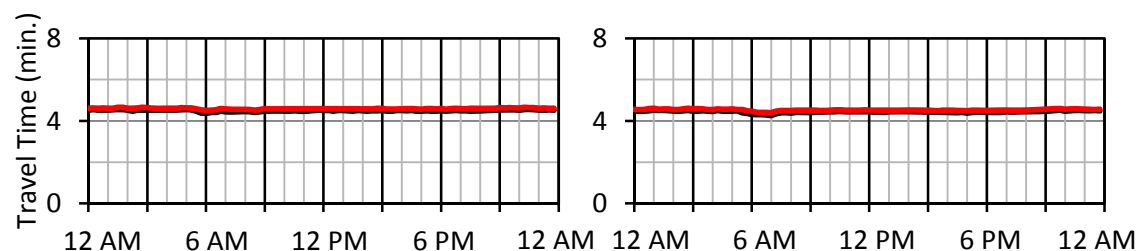
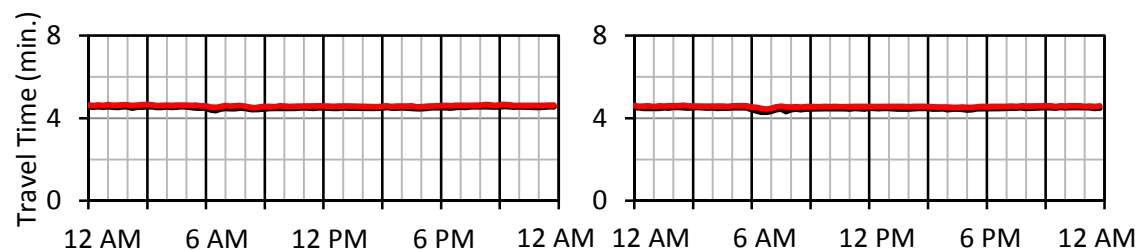
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.26. 2011 &amp; 2012 Westbound I-74 (Acton Rd. to I-465): Quarterly travel time summary.



(a) Corridor details

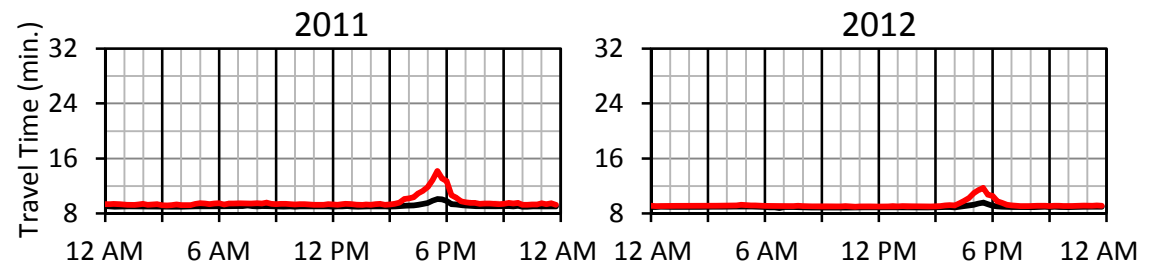
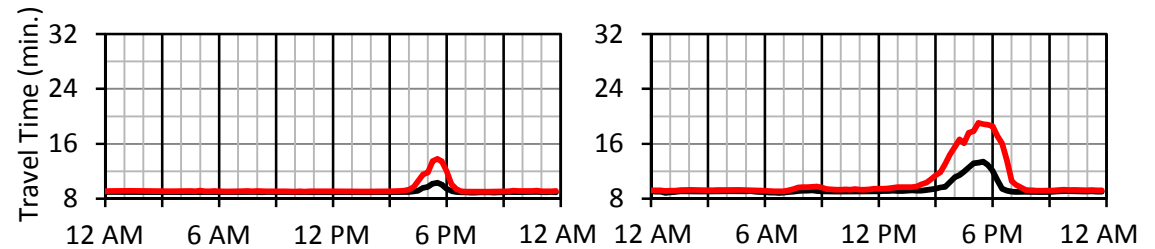
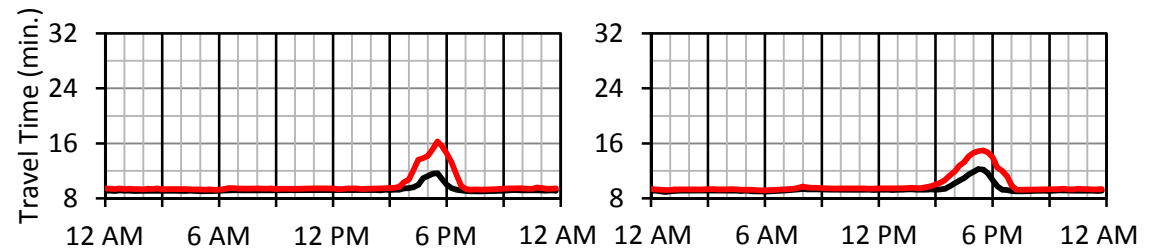
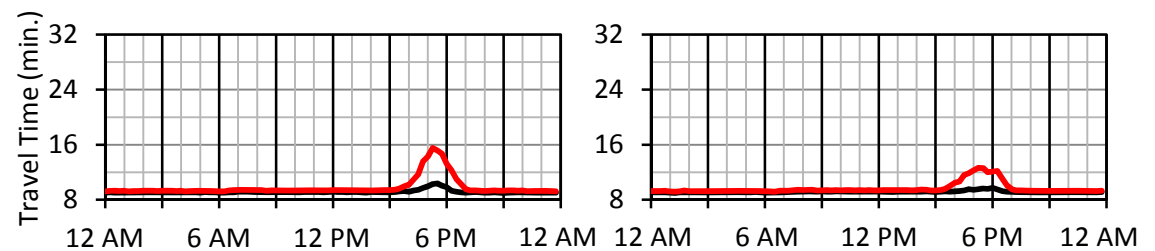
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.27. 2011 &amp; 2012 Northbound I-69 (I-465 to Noblesville): Quarterly travel time summary.

**Roadway:** I-69 SB  
**Year:** 2011/2012  
**Start:** Noblesville  
**End:** I-465  
**Length:** 10.00 miles  
**Lanes:** 2-4  
**Min. AADT:** 61,270



(a) Corridor details

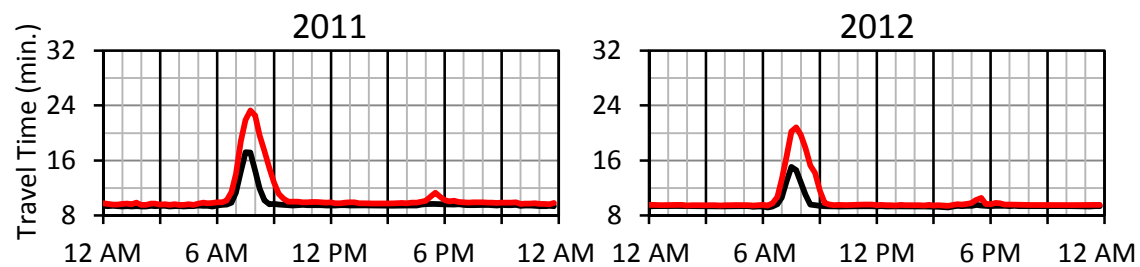
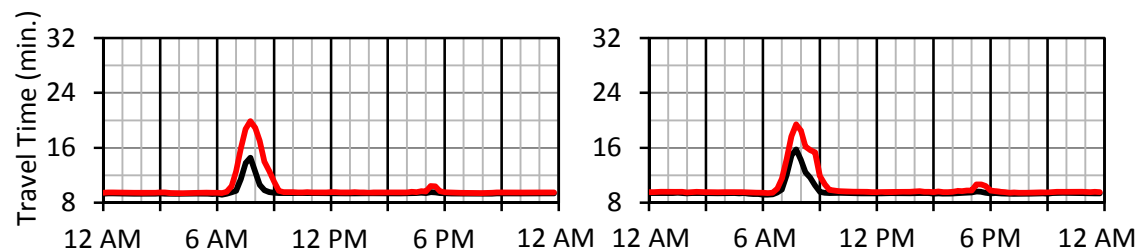
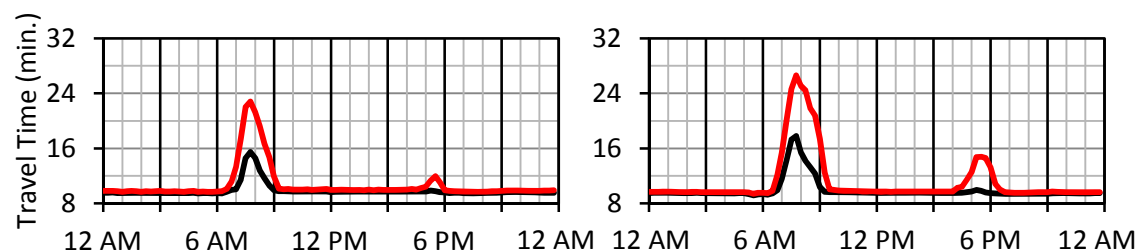
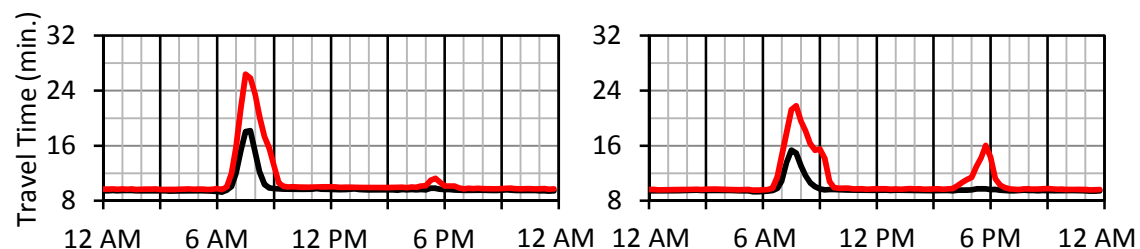
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.28. 2011 &amp; 2012 Southbound I-69 (Noblesville to I-465): Quarterly travel time summary.



**Roadway:** I-465 IL  
**Year:** 2011/2012  
**Start:** I-70  
**End:** I-65  
**Length:** 8.89 miles  
**Lanes:** 3-4  
**Min. AADT:** 110,040



(a) Corridor details

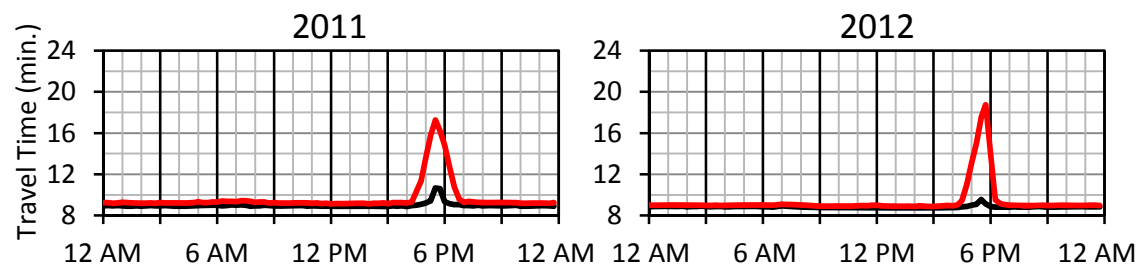
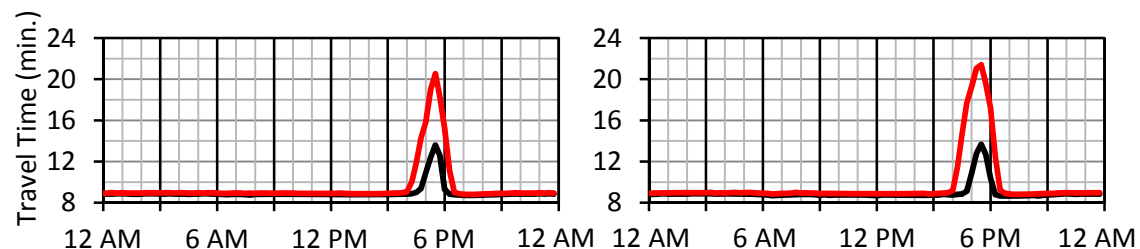
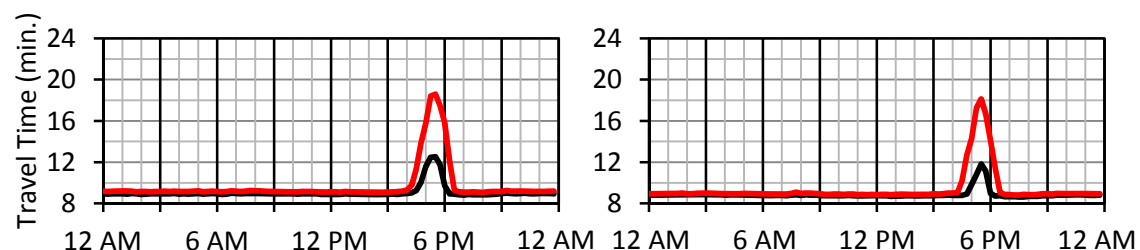
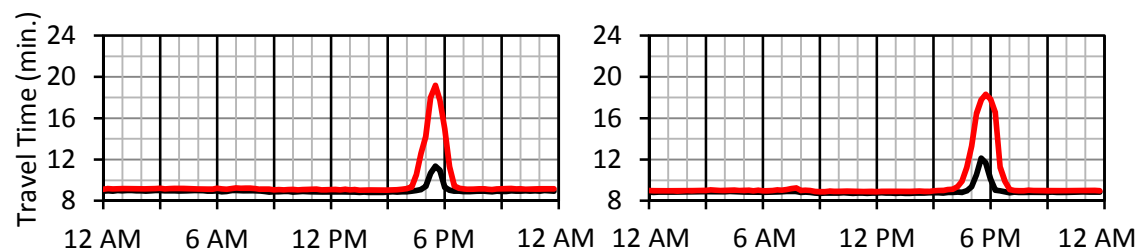
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.29. 2011 &amp; 2012 Inner loop I-465 (I-70 to I-65): Quarterly travel time summary.

**Roadway:** I-465 OL  
**Year:** 2011/2012  
**Start:** I-65  
**End:** I-70  
**Length:** 9.13 miles  
**Lanes:** 3-4  
**Min. AADT:** 110,040



(a) Corridor details

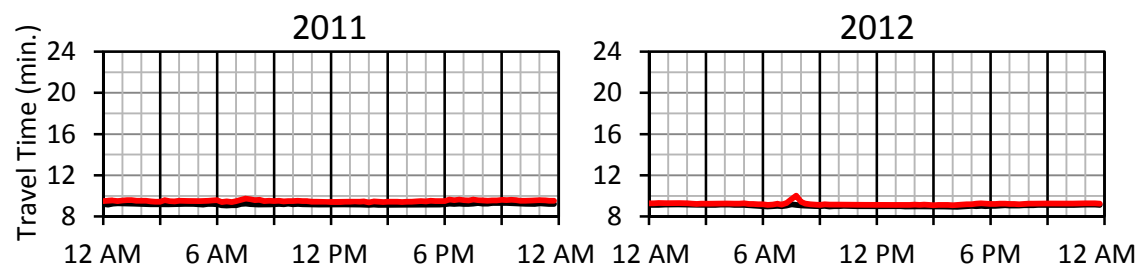
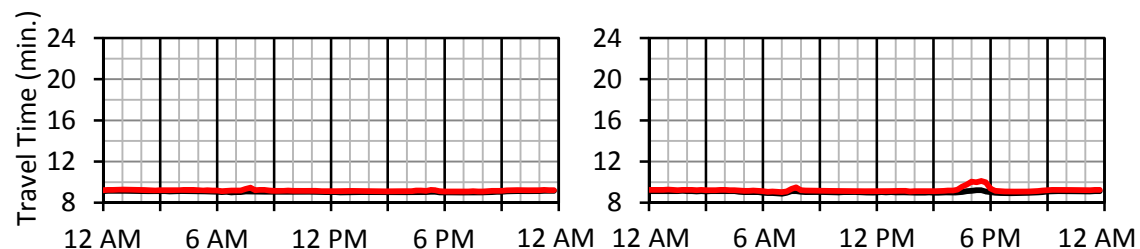
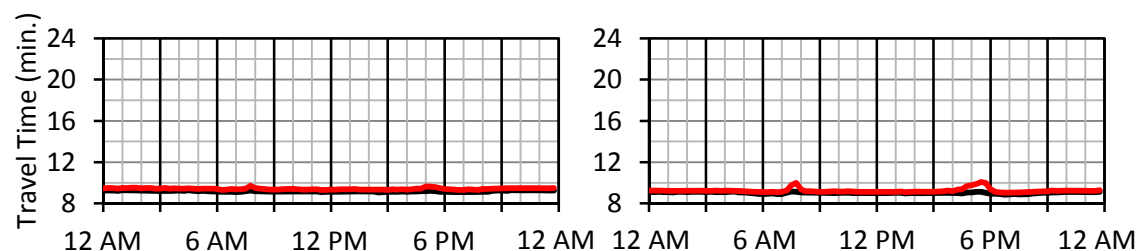
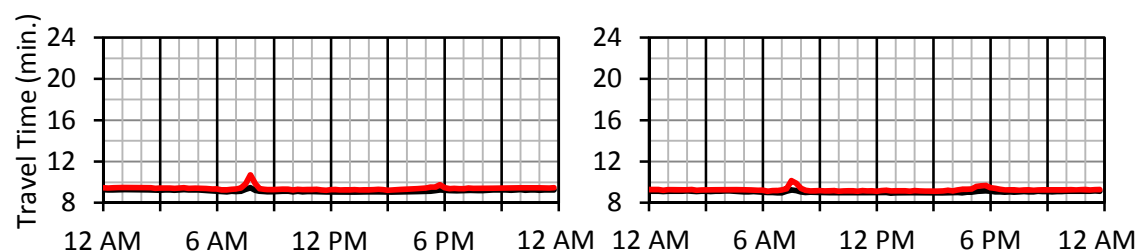
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.30. 2011 &amp; 2012 Outer loop I-465 (I-65 to I-70): Quarterly travel time summary.



(a) Corridor details

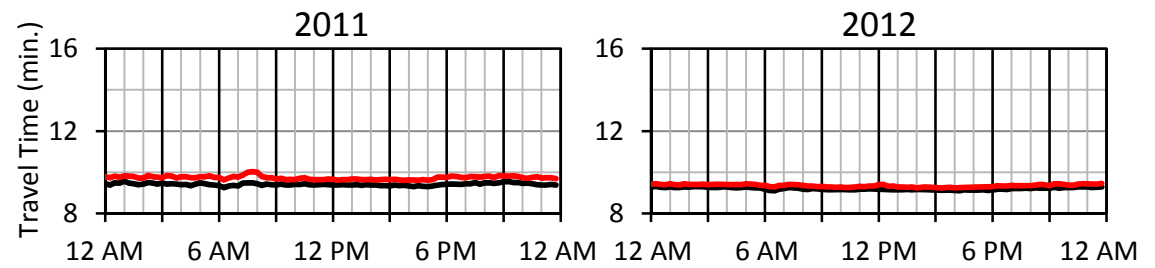
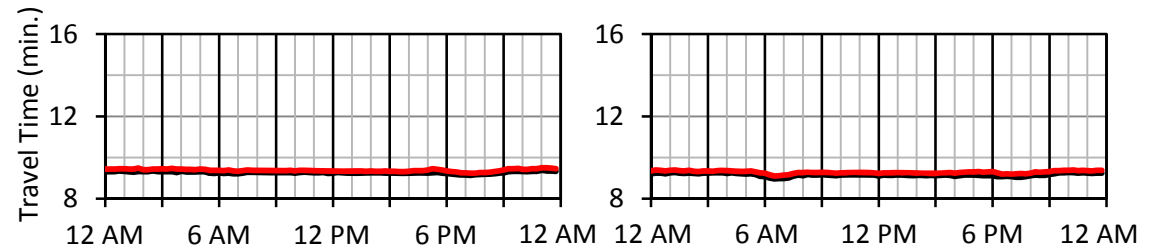
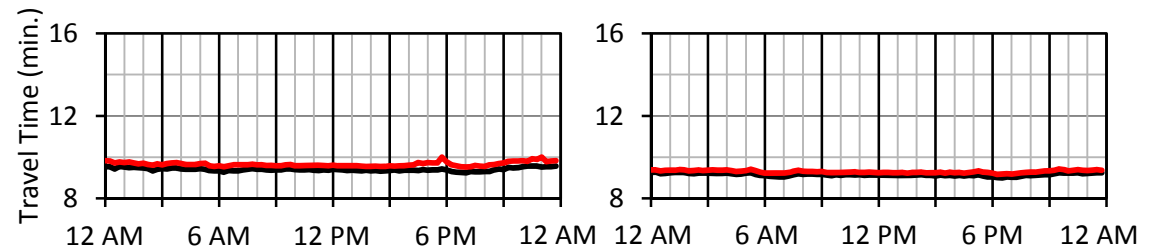
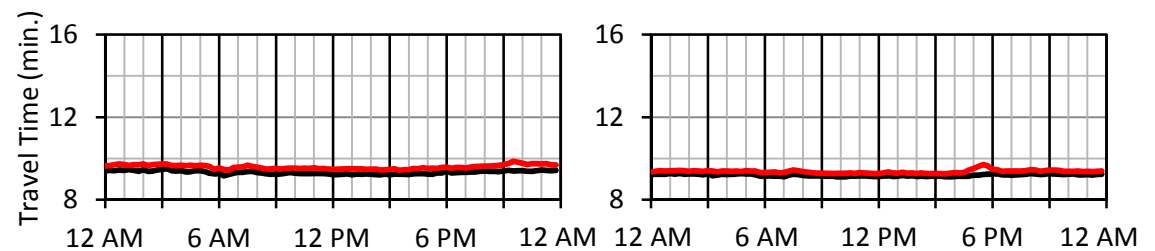
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.31. 2011 &amp; 2012 Inner loop I-465 (I-65 to I-70): Quarterly travel time summary.





(a) Corridor details

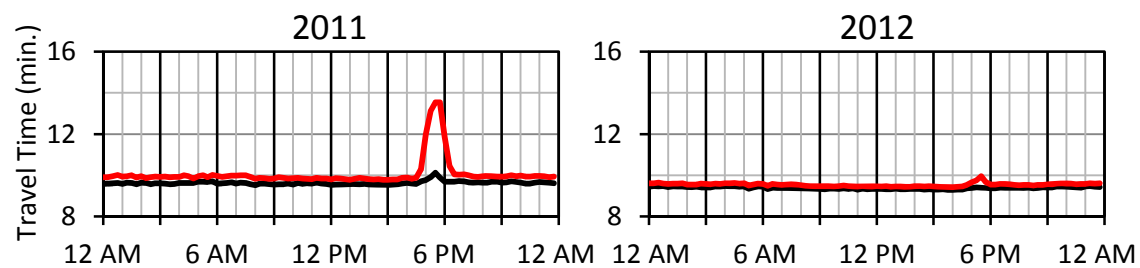
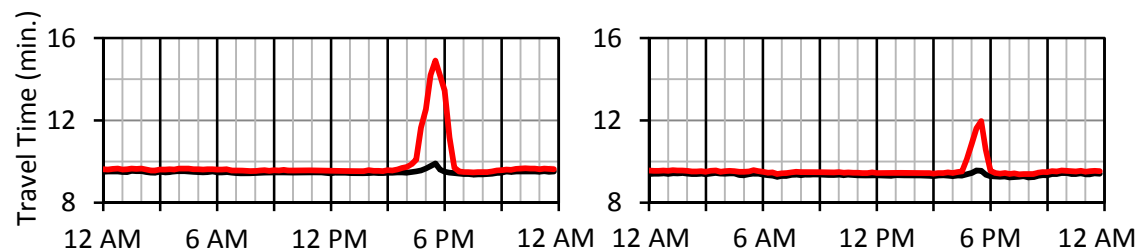
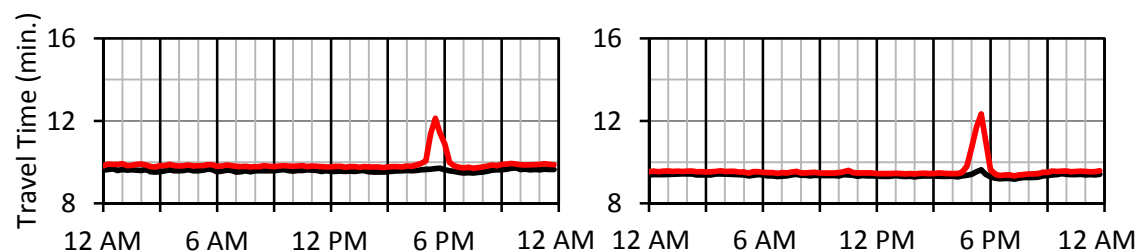
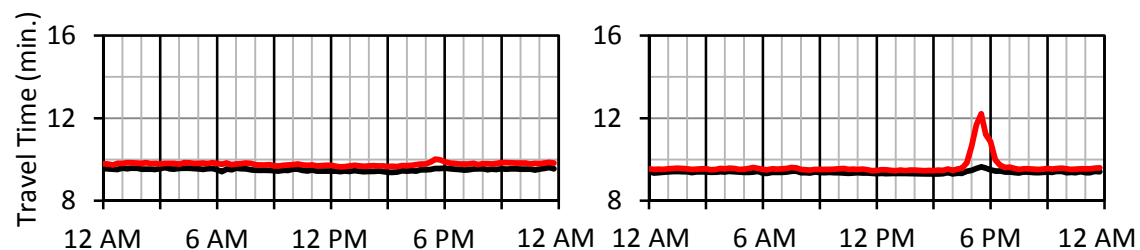
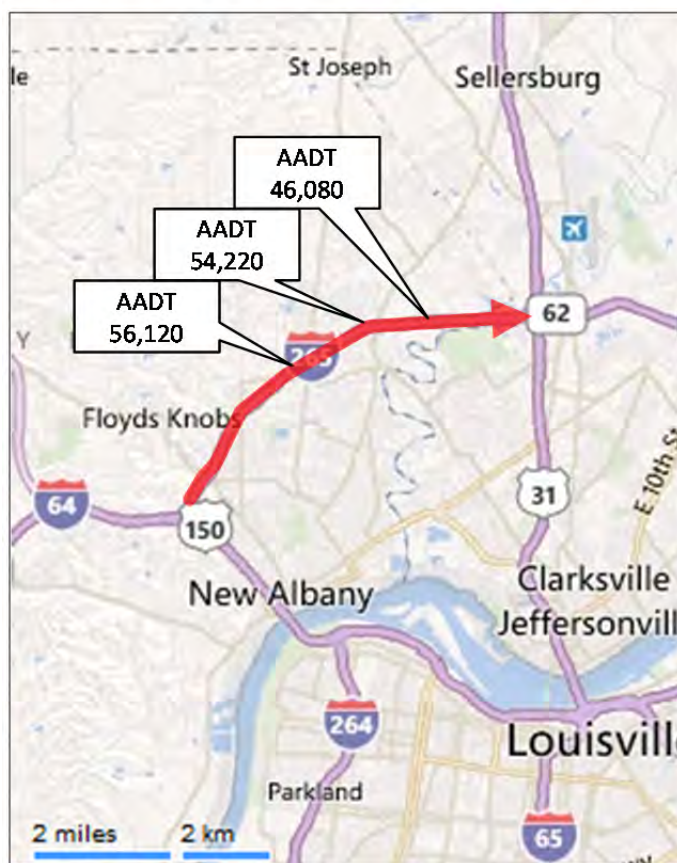
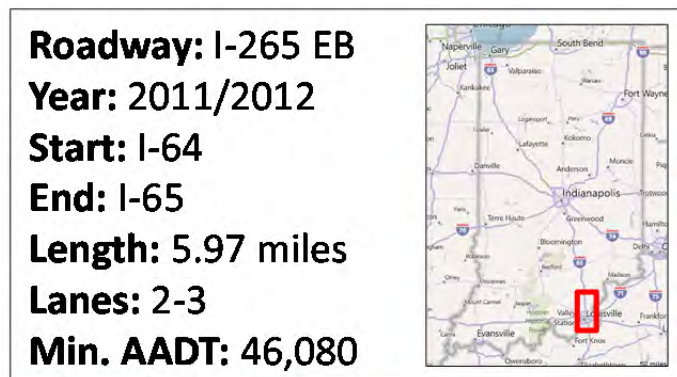
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.32. 2011 &amp; 2012 Outer loop I-465 (I-70 to I-65): Quarterly travel time summary.



(a) Corridor details

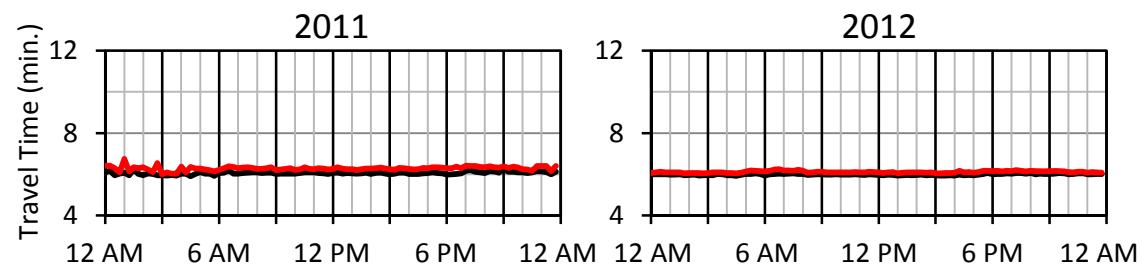
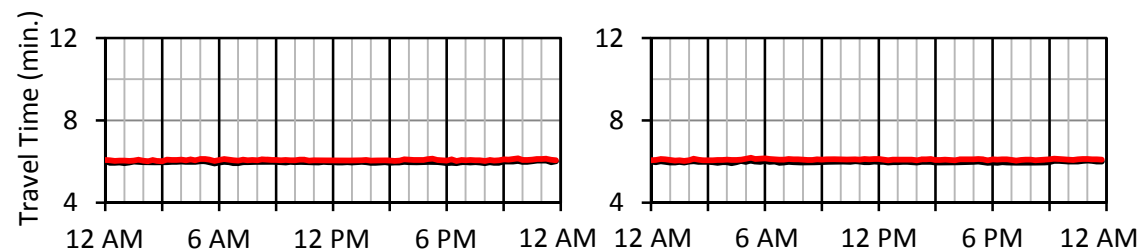
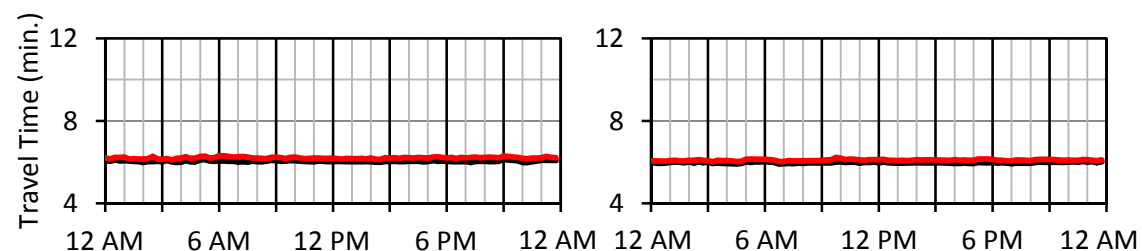
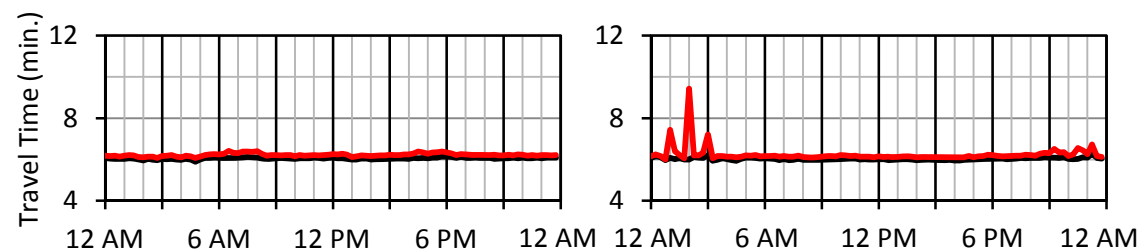
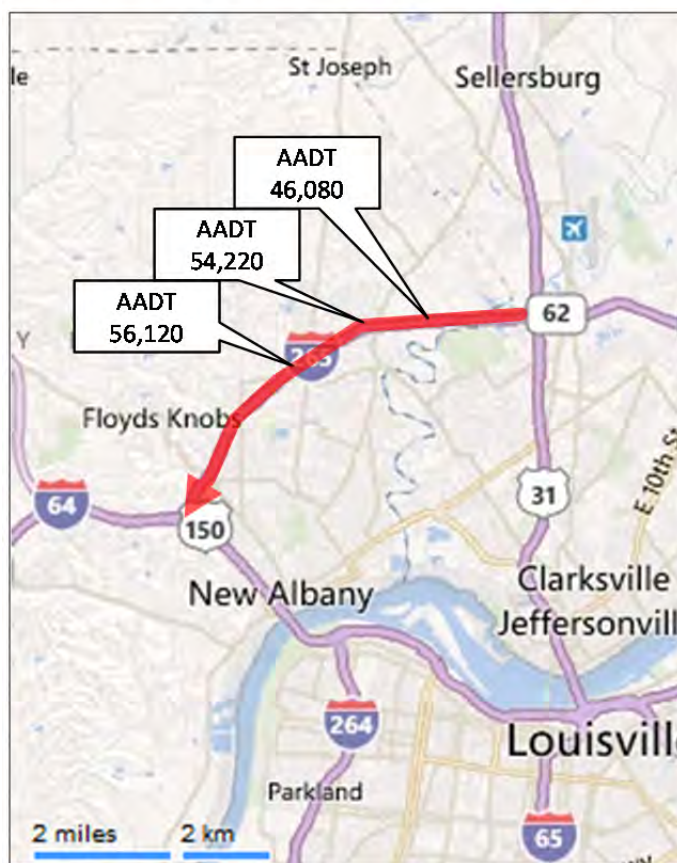
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.33. 2011 &amp; 2012 Eastbound I-265 (I-64 to I-65): Quarterly travel time summary.



(a) Corridor details

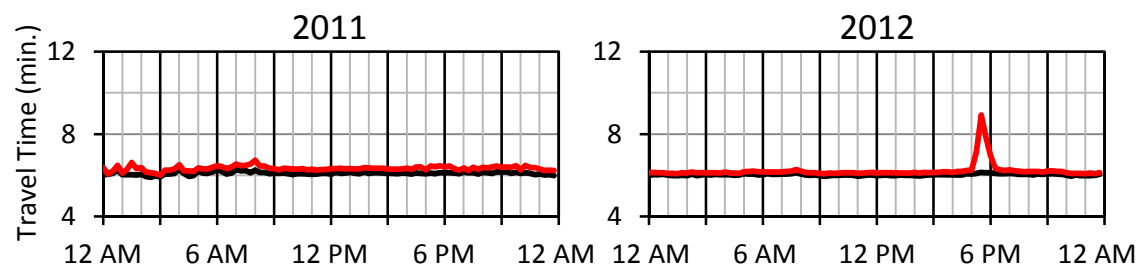
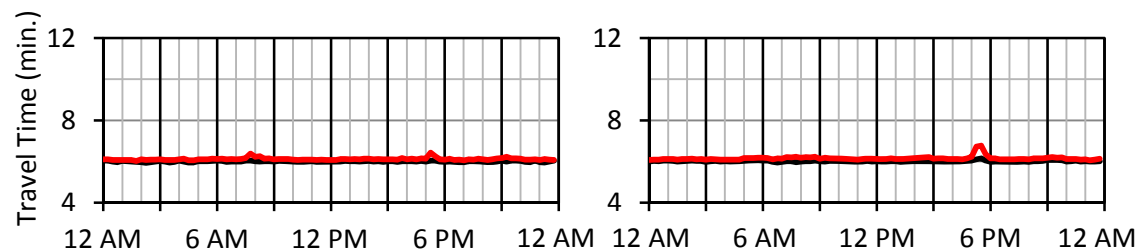
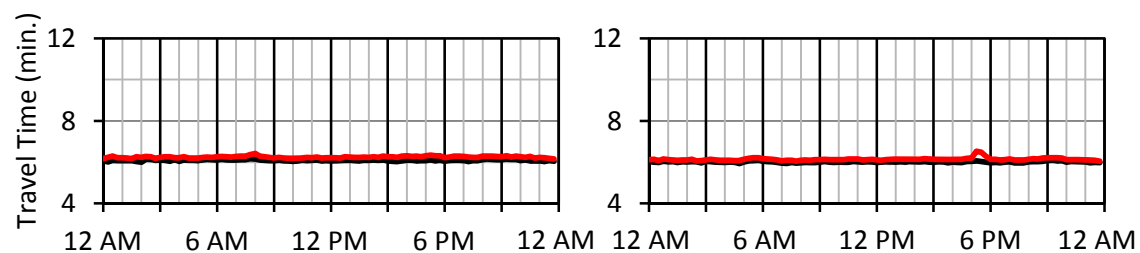
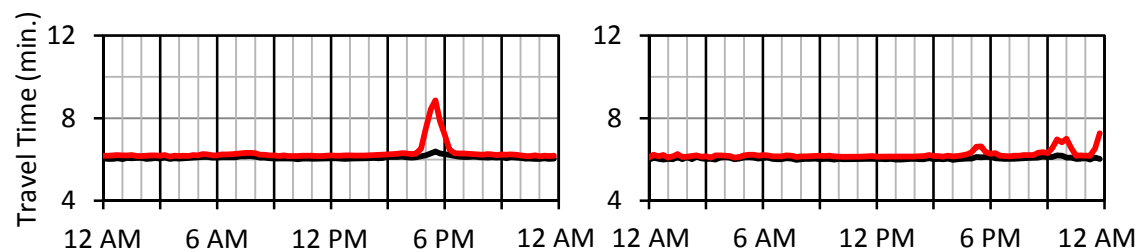
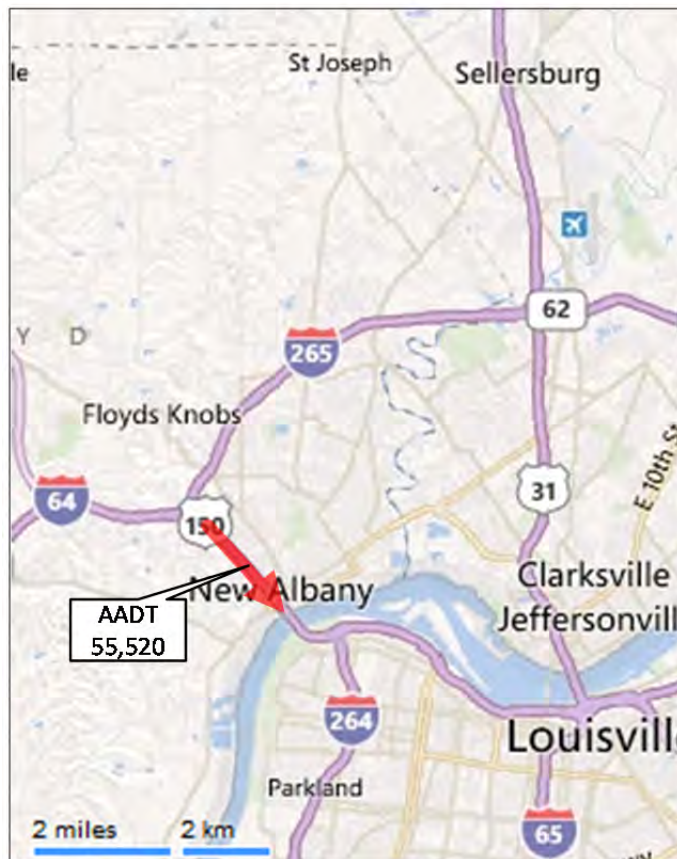
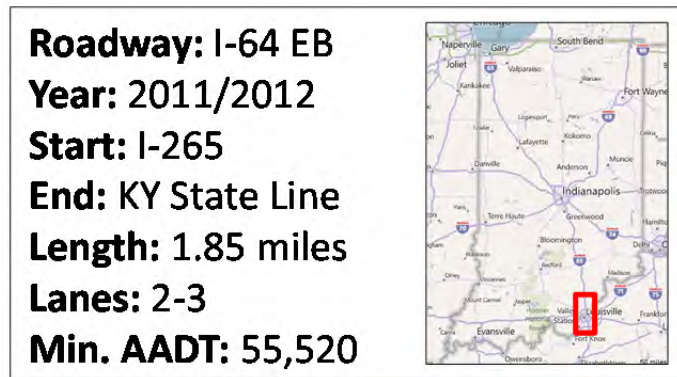
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.34. 2011 &amp; 2012 Westbound I-65 (I-65 to I-64): Quarterly travel time summary.





(a) Corridor details

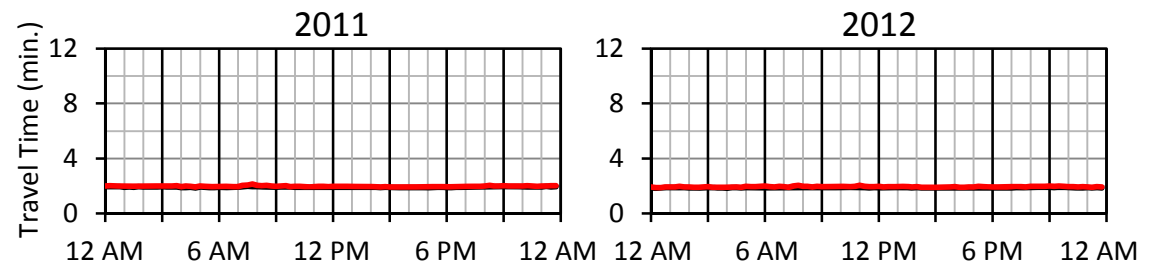
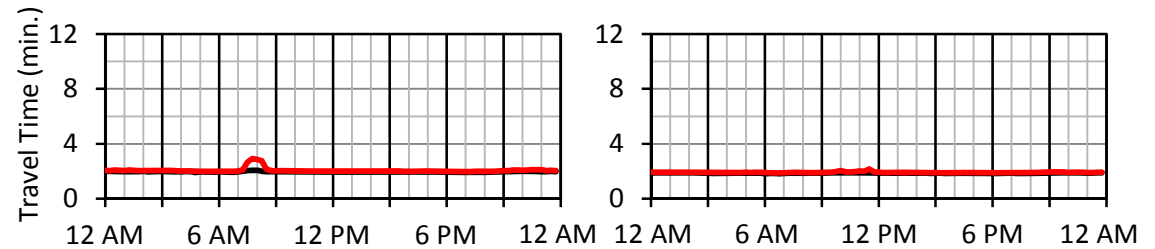
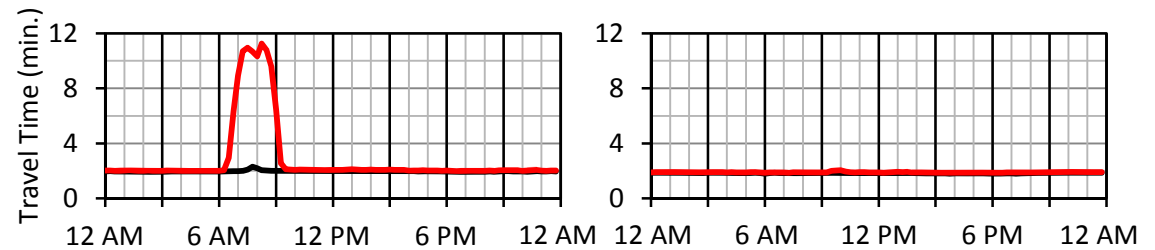
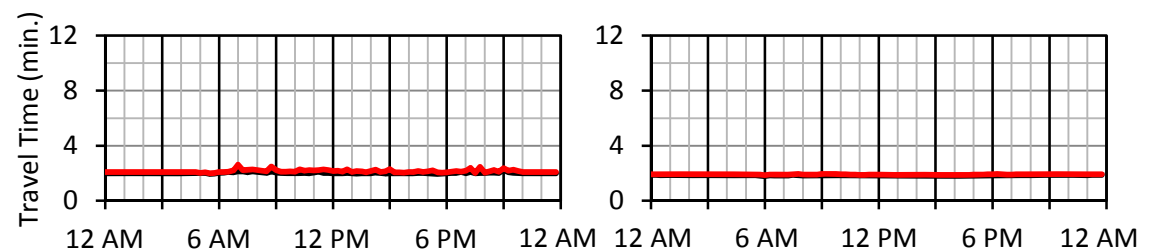
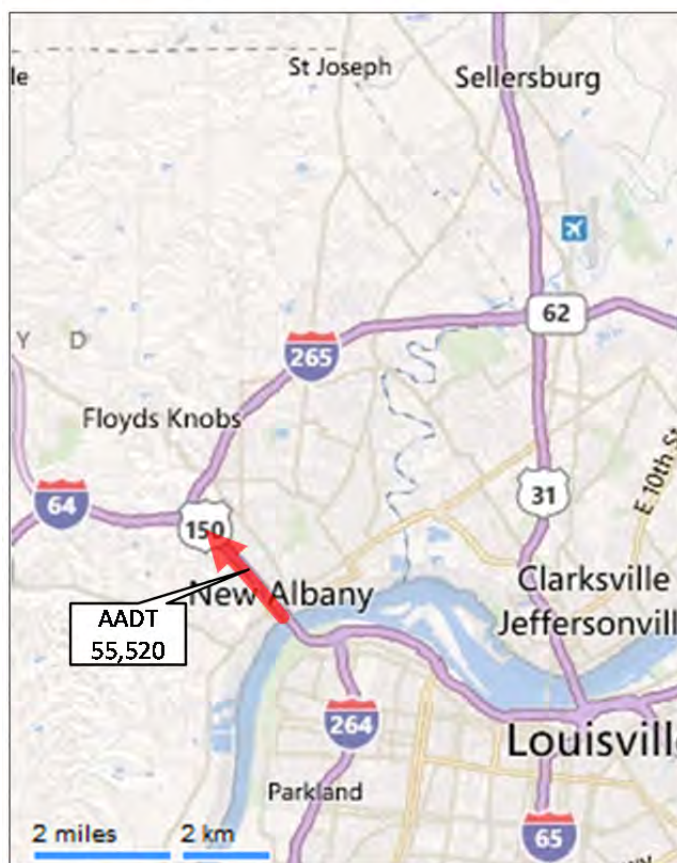
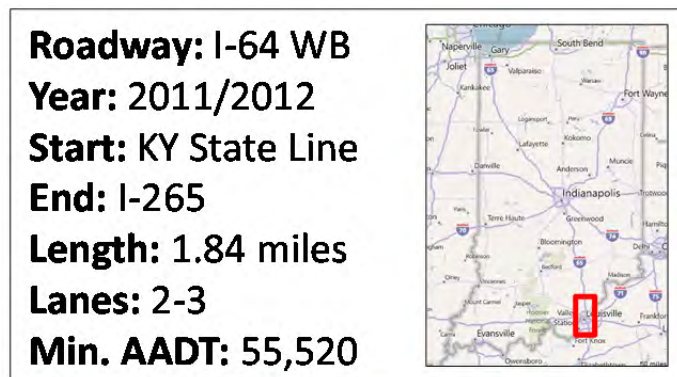
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.35. 2011 &amp; 2012 Eastbound I-64 (I-265 to Kentucky state line): Quarterly travel time summary.



(a) Corridor details

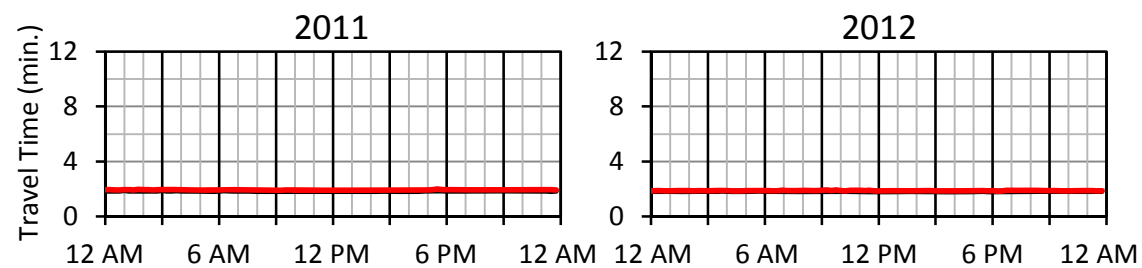
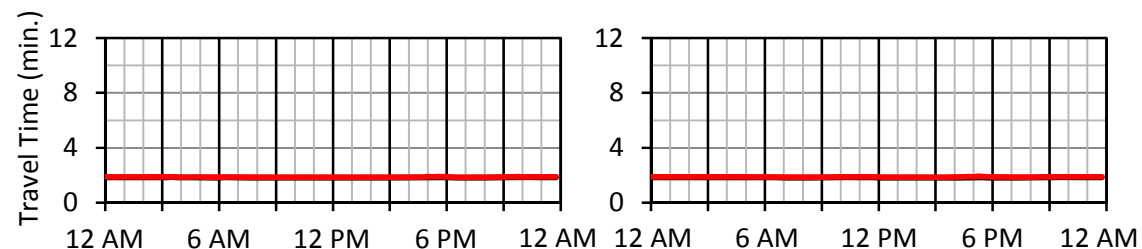
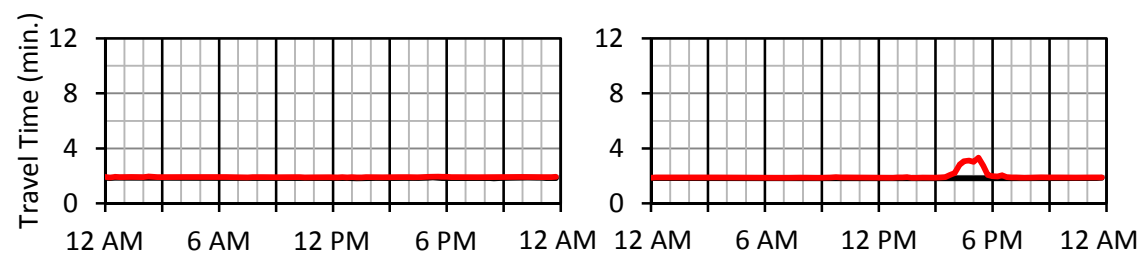
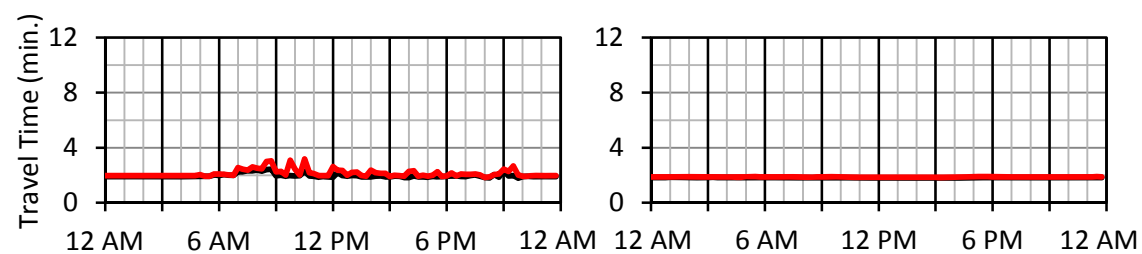
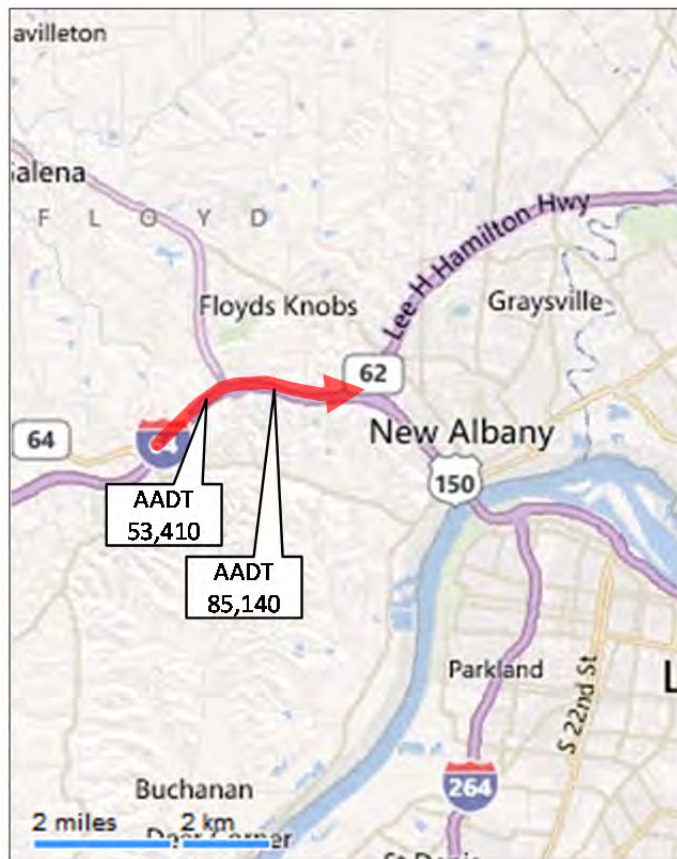
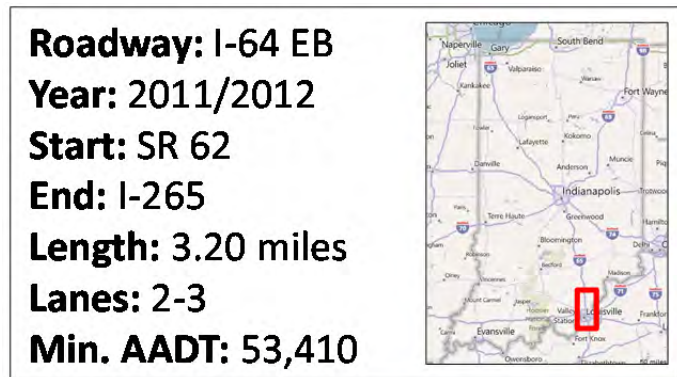
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.36. 2011 &amp; 2012 Westbound I-64 (Kentucky state line to I-265): Quarterly travel time summary.



(a) Corridor details

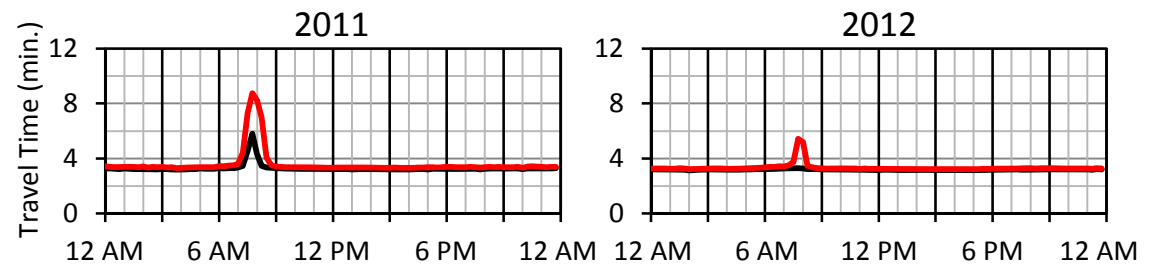
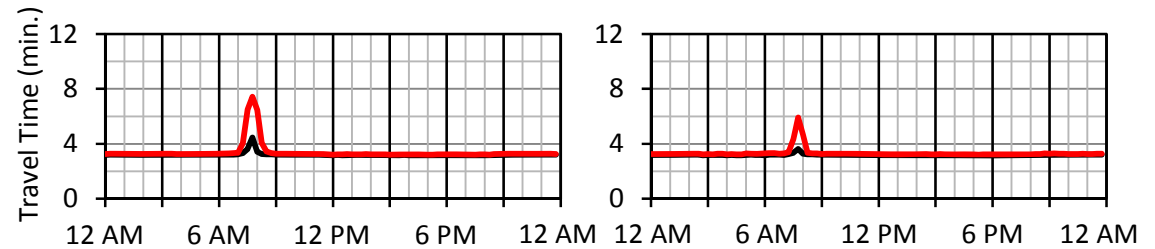
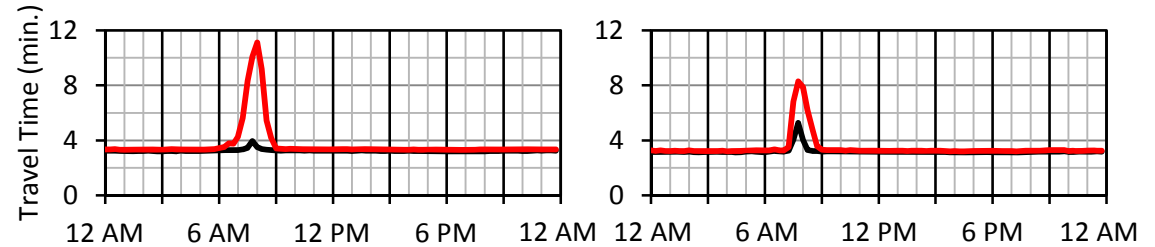
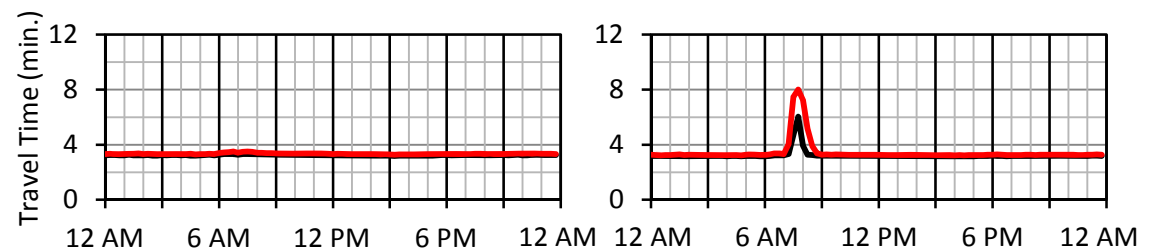
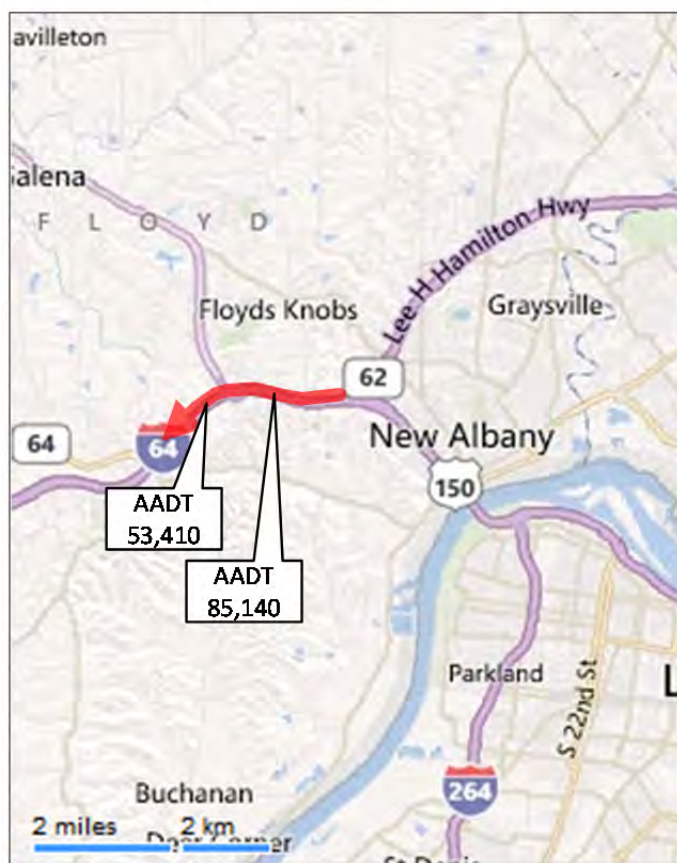
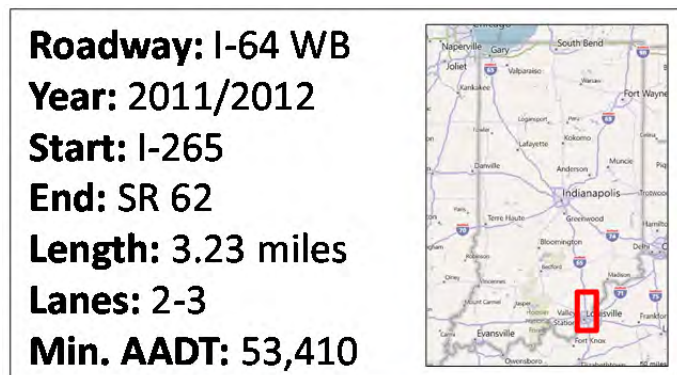
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.37. 2011 &amp; 2012 Eastbound I-64 (SR 62 to I-265): Quarterly travel time summary.





(a) Corridor details

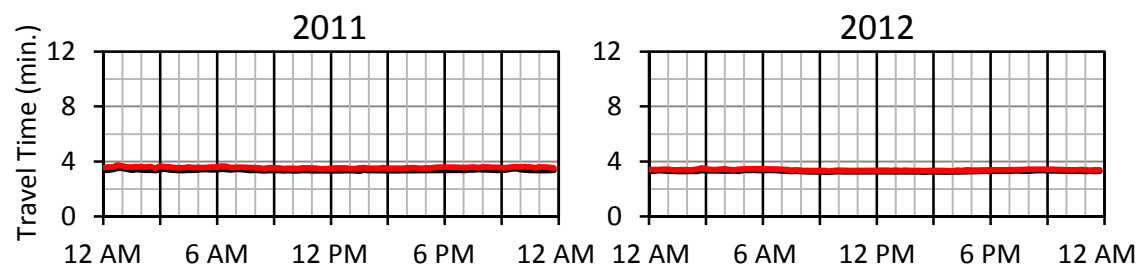
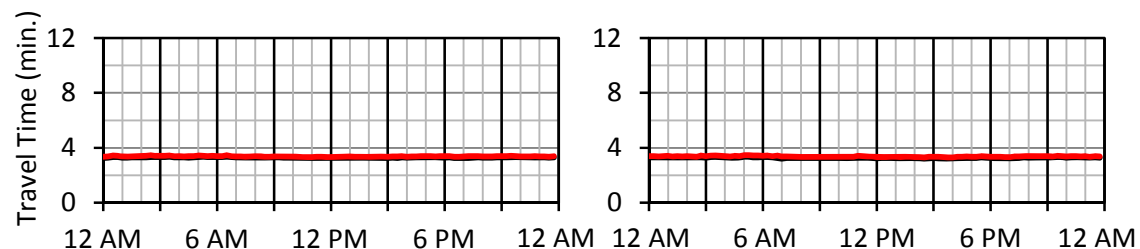
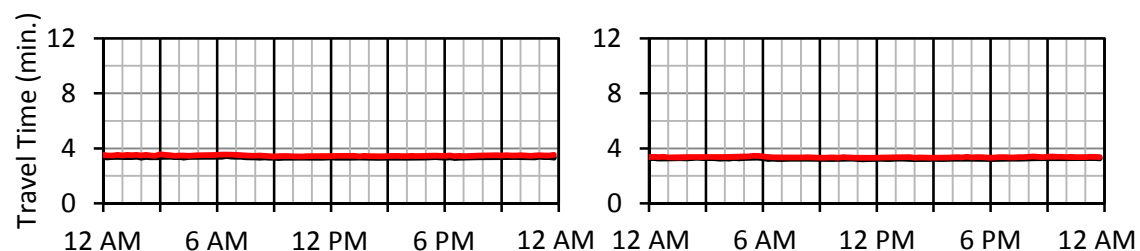
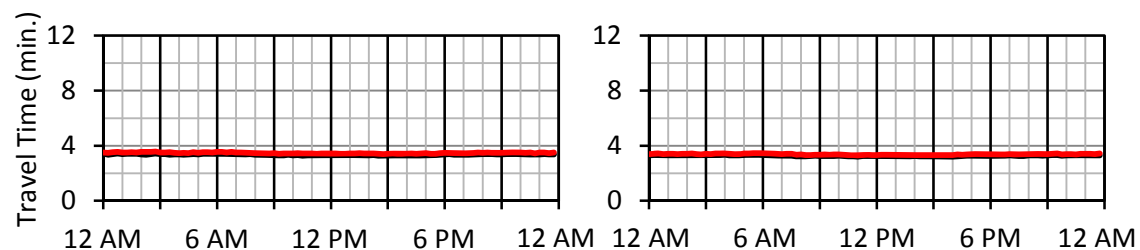
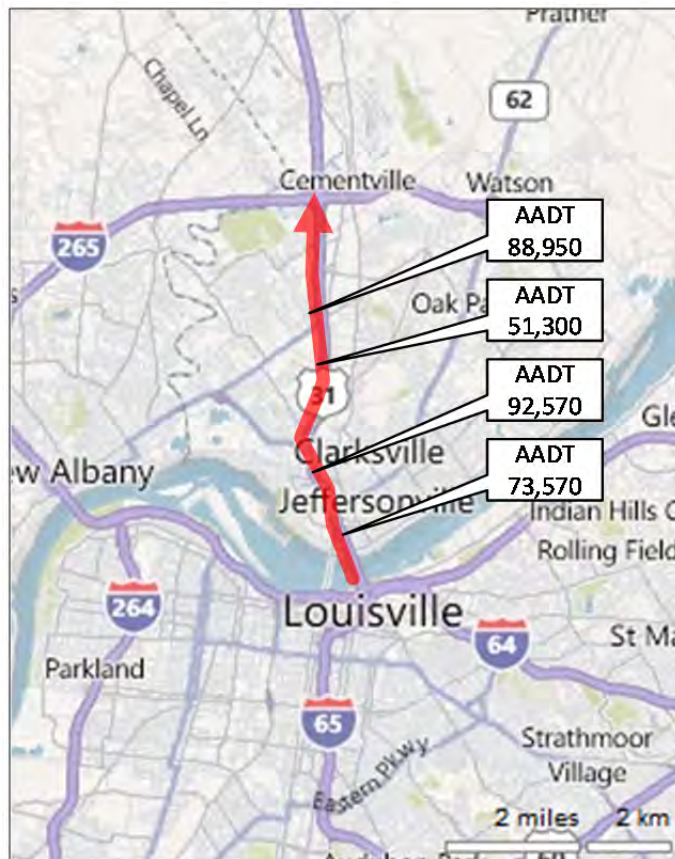
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.38. 2011 &amp; 2012 Westbound I-64 (I-265 to SR 62): Quarterly travel time summary.



(a) Corridor details

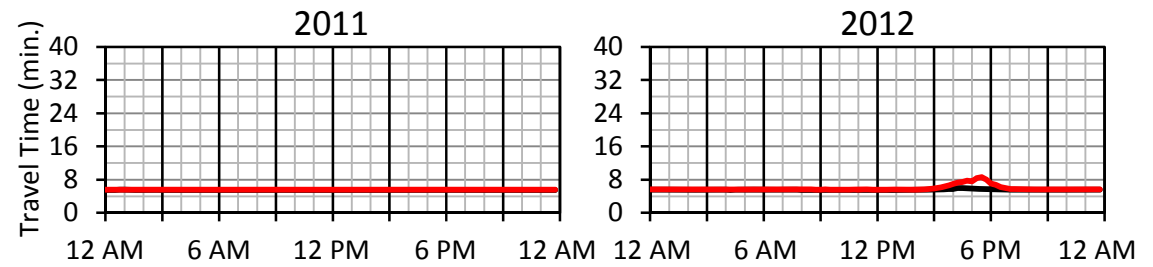
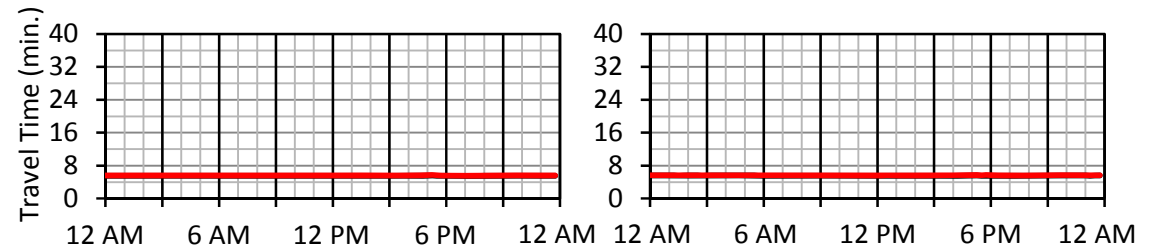
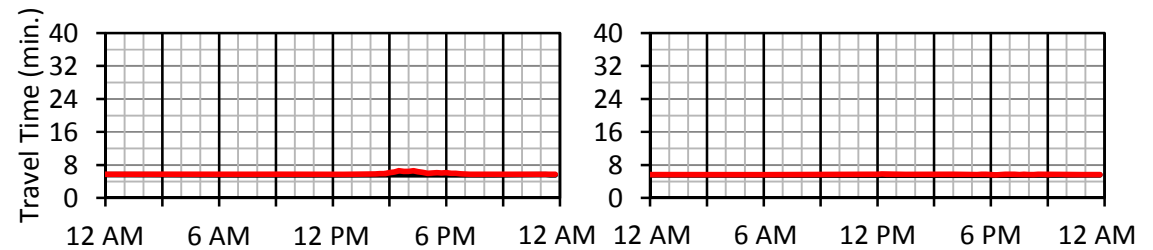
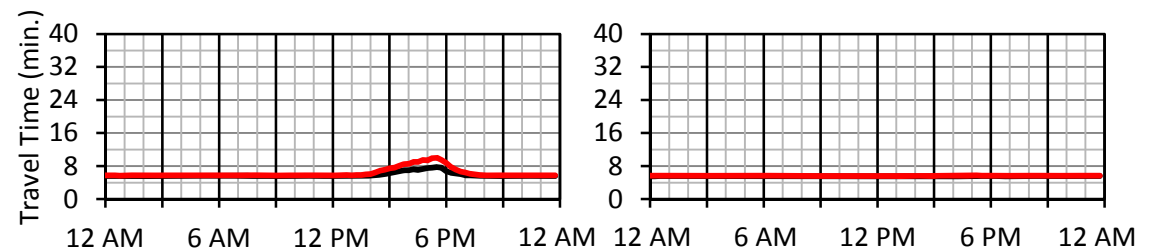
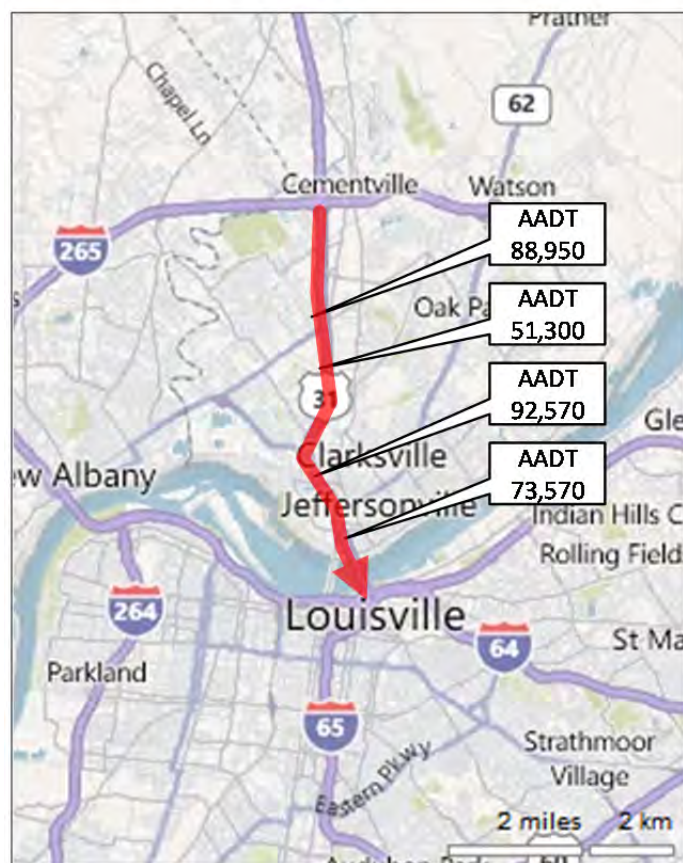
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.39. 2011 &amp; 2012 Northbound I-65 (Kentucky state line to I-265): Quarterly travel time summary.

**Roadway:** I-65 SB  
**Year:** 2011/2012  
**Start:** I-265  
**End:** KY State Line  
**Length:** 5.69 miles  
**Lanes:** 3-4  
**Min. AADT:** 51,300



(a) Corridor details

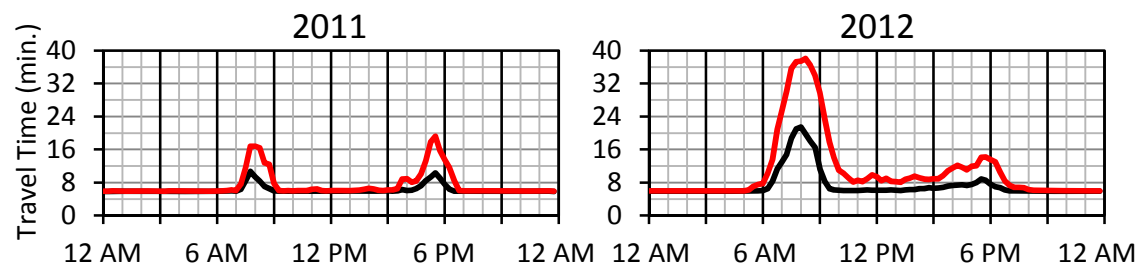
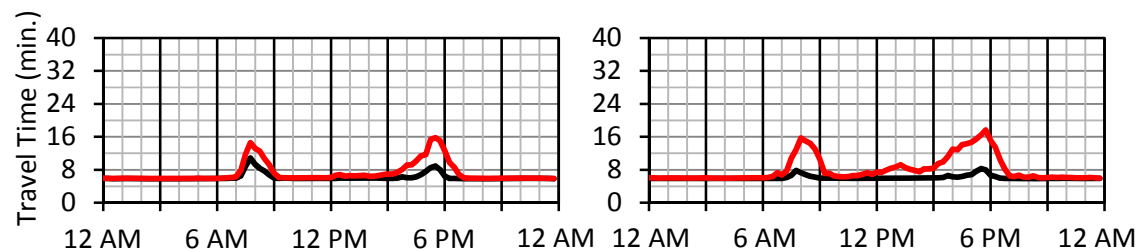
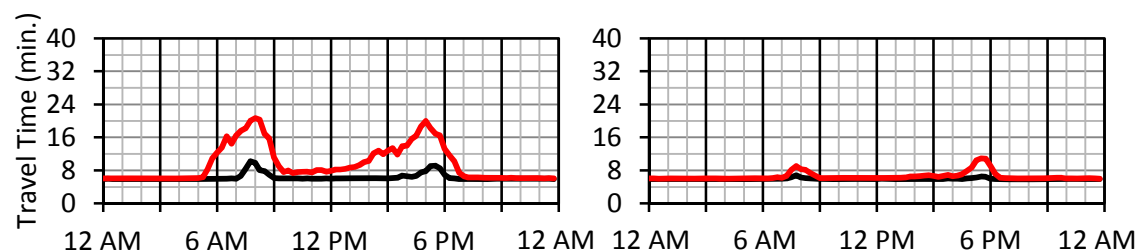
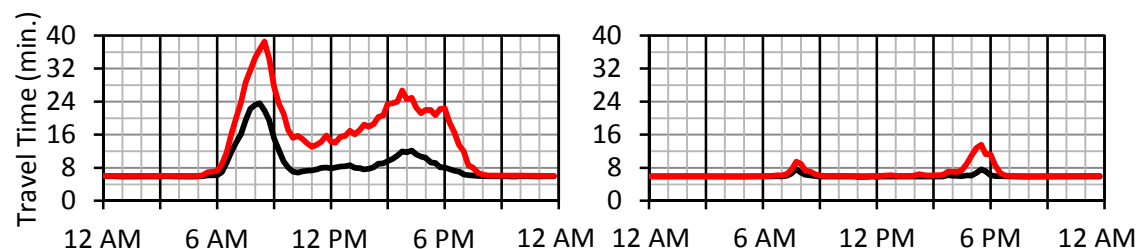
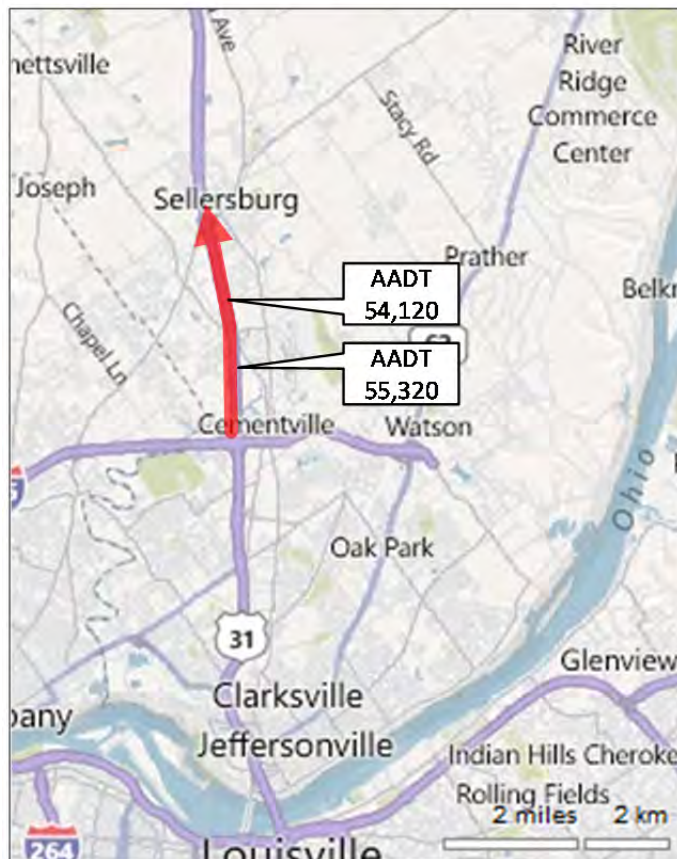
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.40. 2011 &amp; 2012 Southbound I-65 (I-265 to Kentucky state line): Quarterly travel time summary.





(a) Corridor details

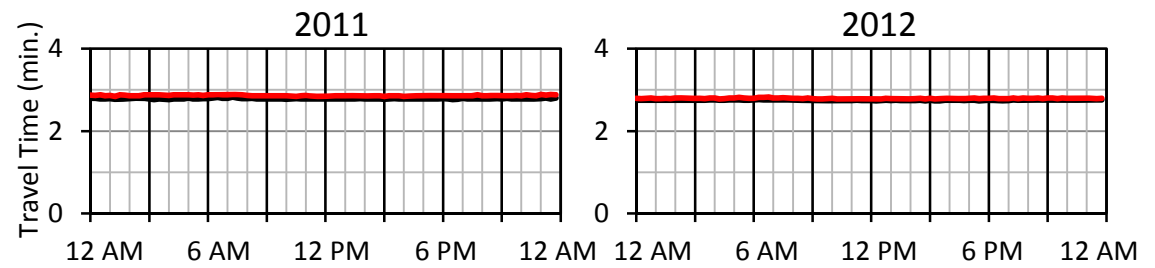
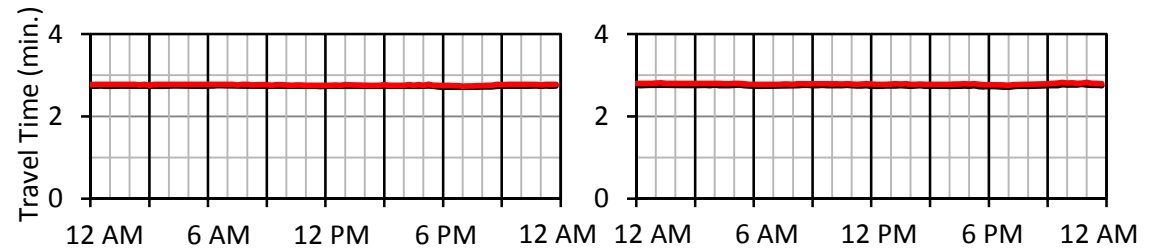
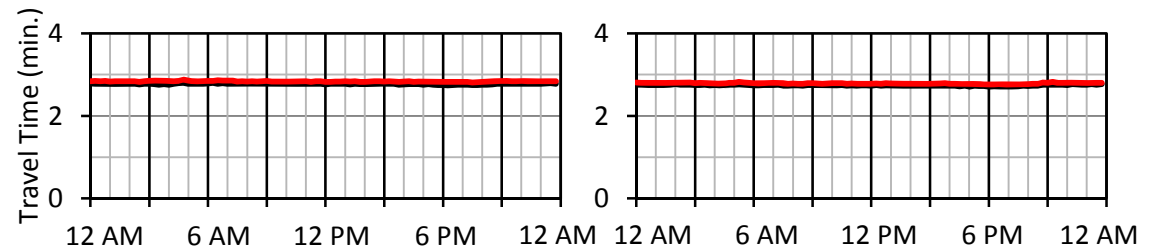
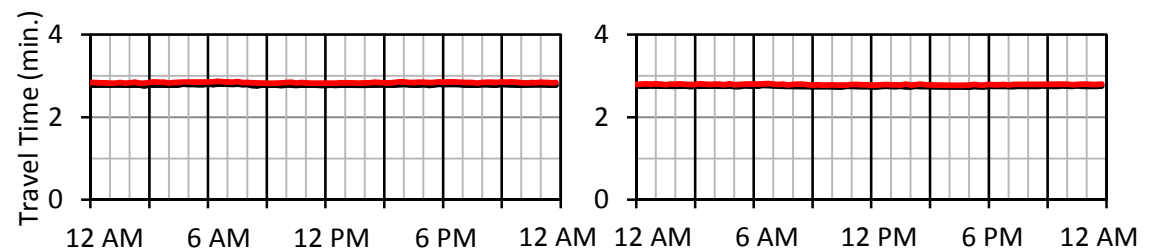
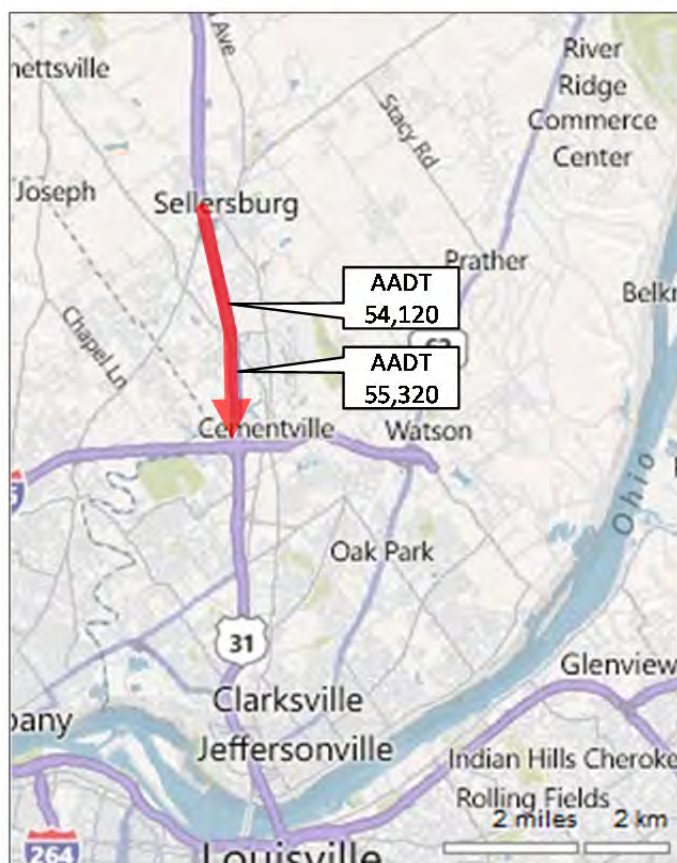
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.41. 2011 &amp; 2012 Northbound I-65 (I-265 to Sellersburg): Quarterly travel time summary.



(a) Corridor details

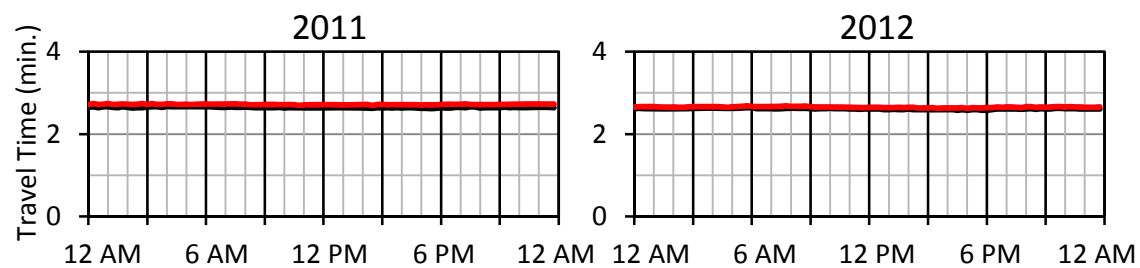
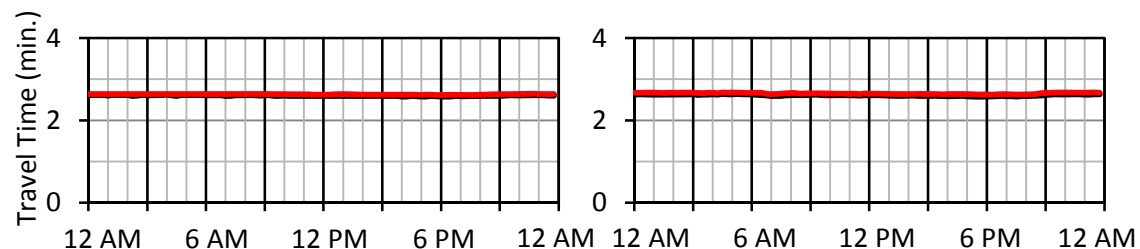
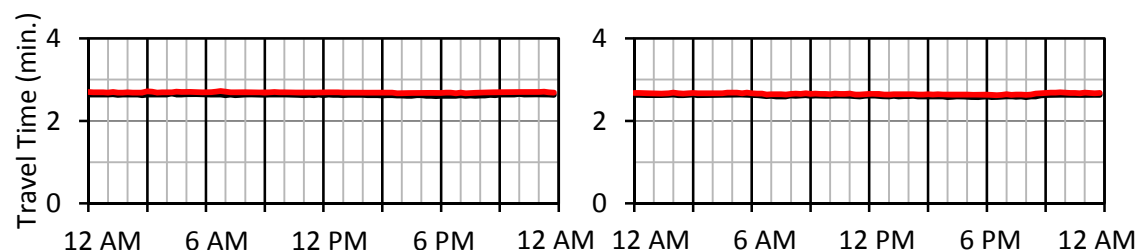
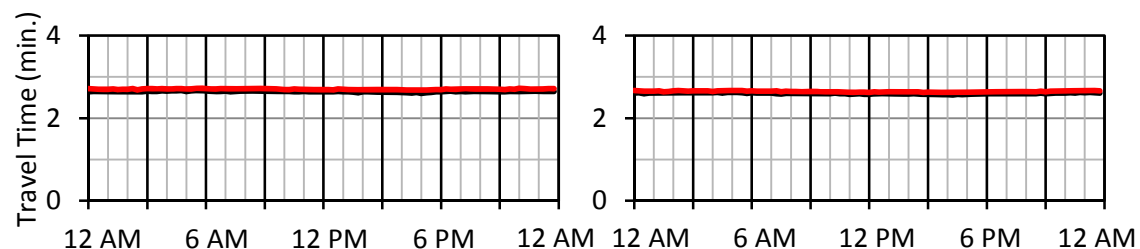
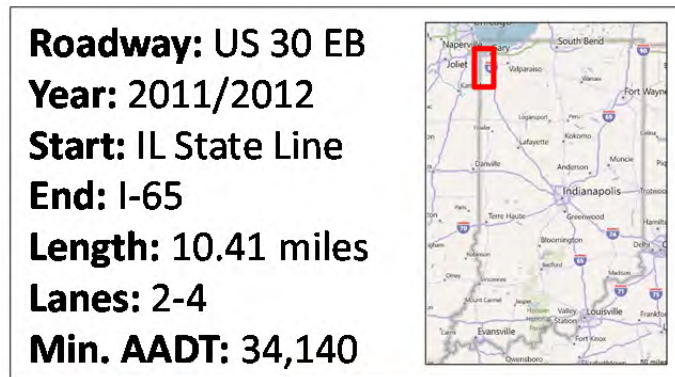
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.42. 2011 &amp; 2012 Southbound I-65 (Sellersburg to I-265): Quarterly travel time summary.



(a) Corridor details

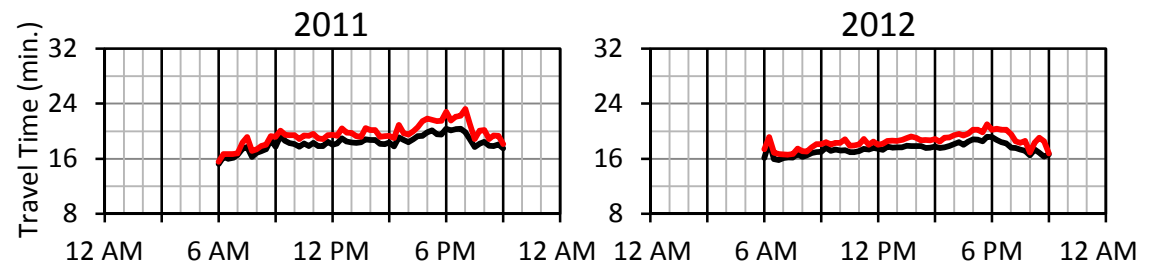
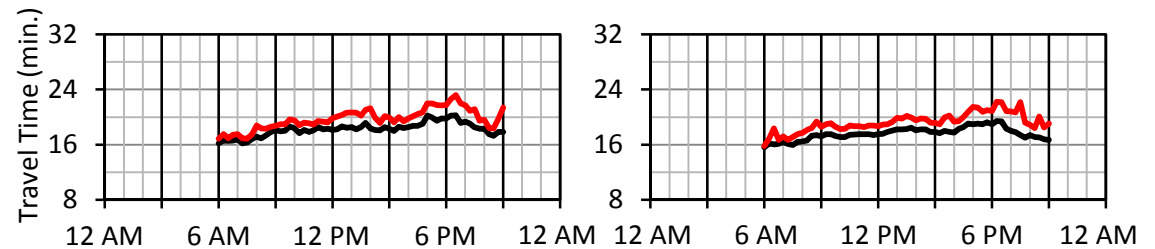
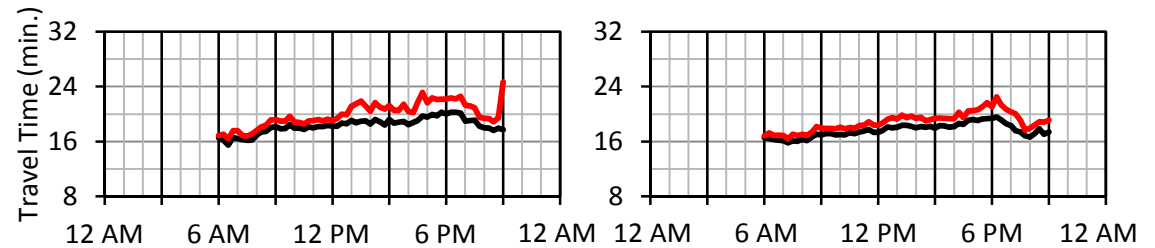
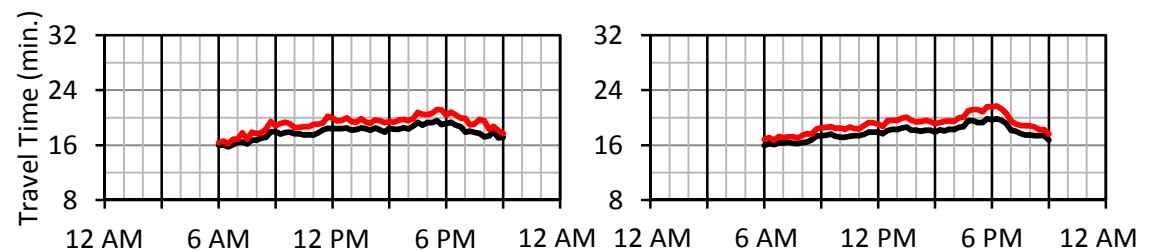
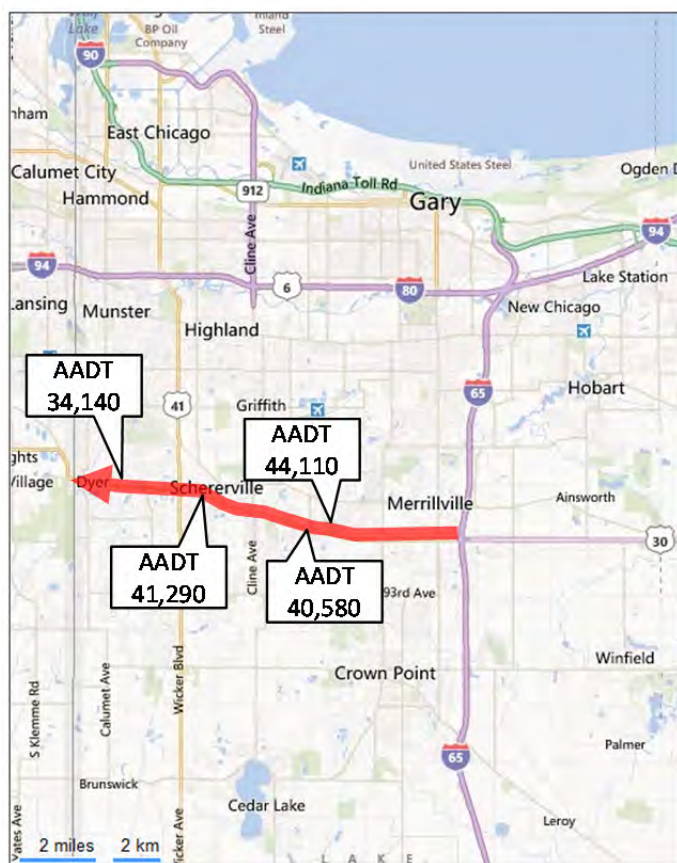
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.43. 2011 &amp; 2012 Eastbound US 30 (Illinois state line to I-65): Quarterly travel time summary.





a) Corridor details

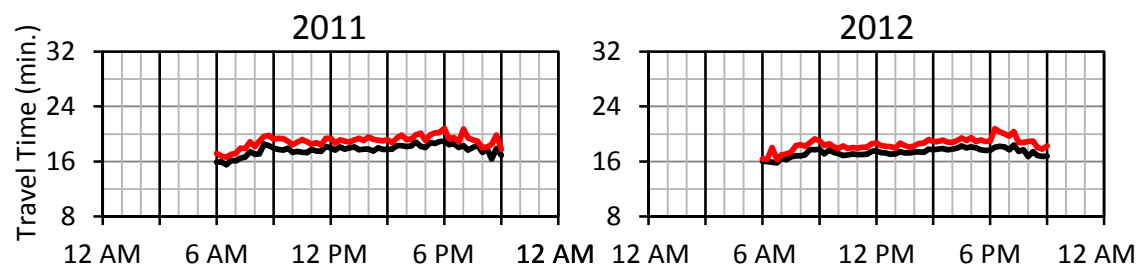
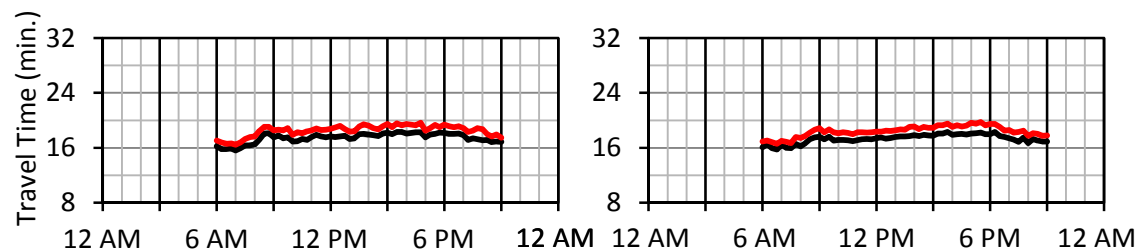
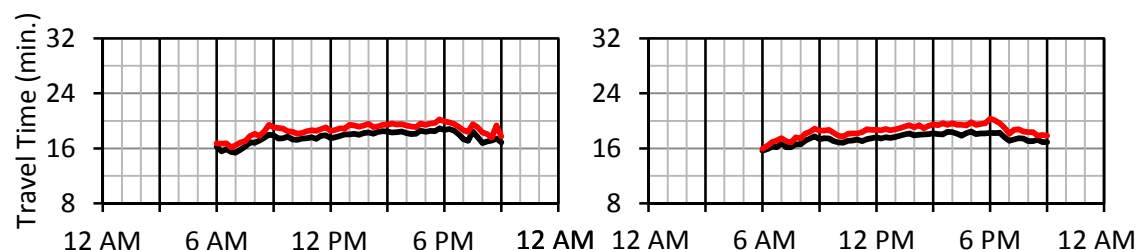
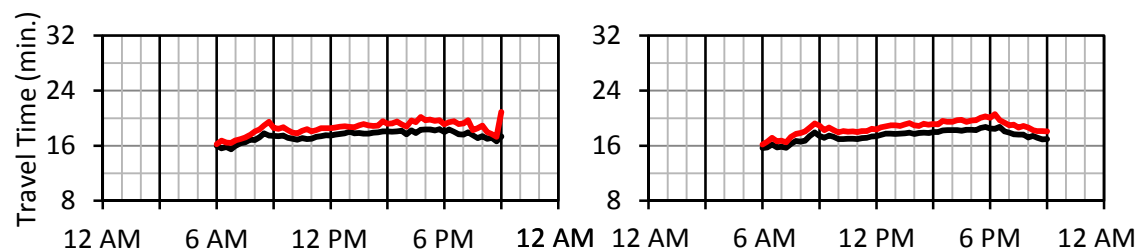
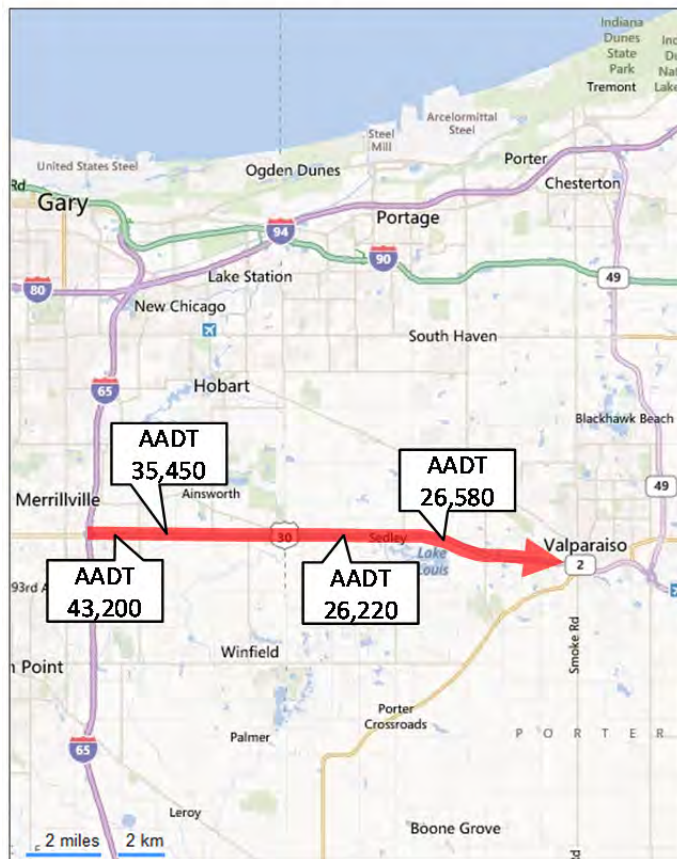
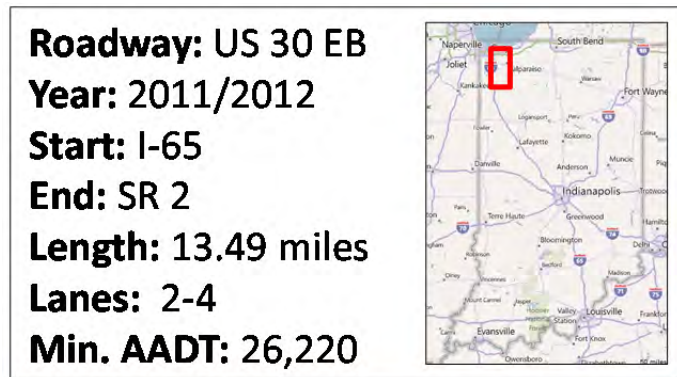
b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.44. 2011 &amp; 2012 Westbound US 30 (I-65 to Illinois state line): Quarterly travel time summary.



(a) Corridor details

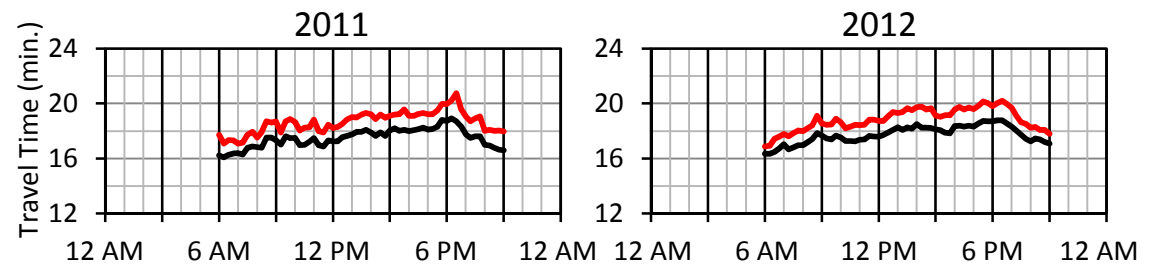
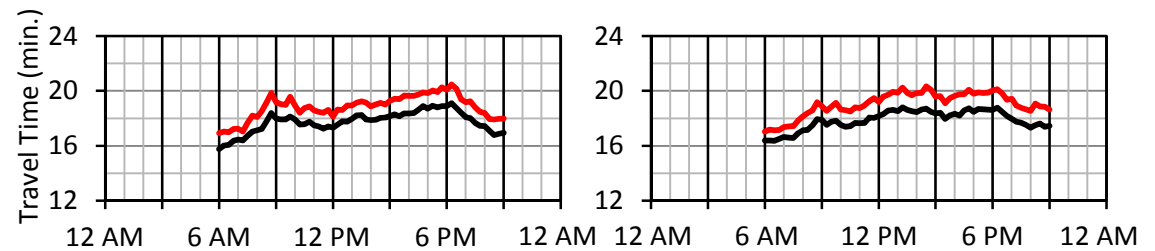
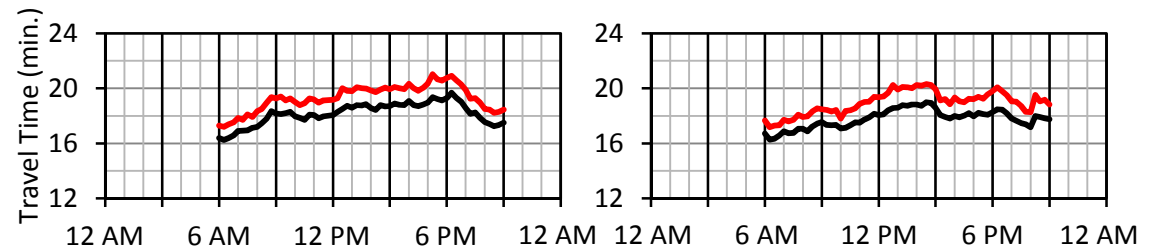
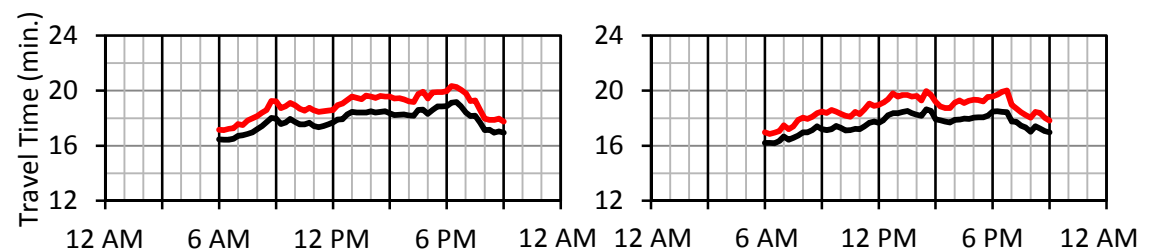
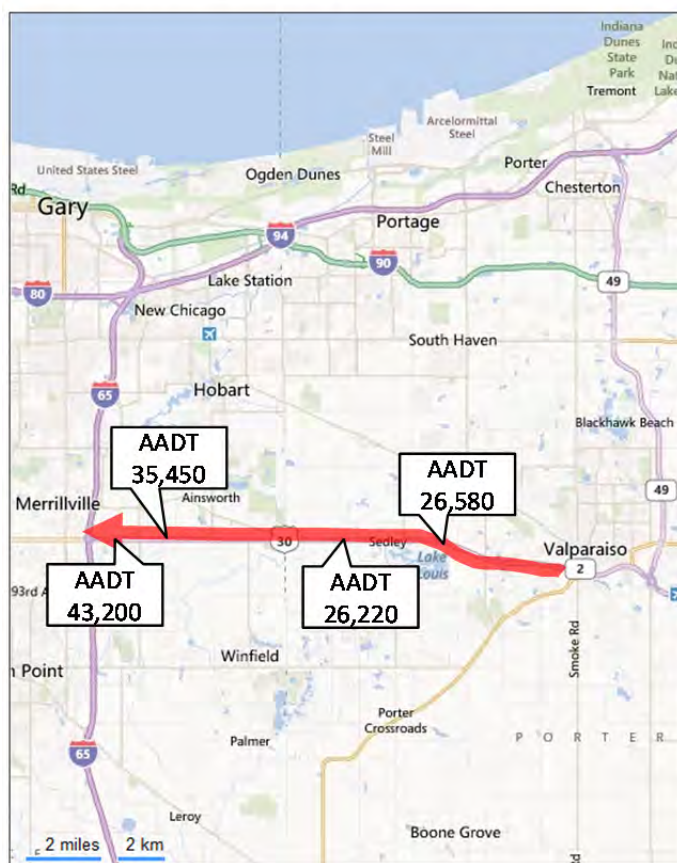
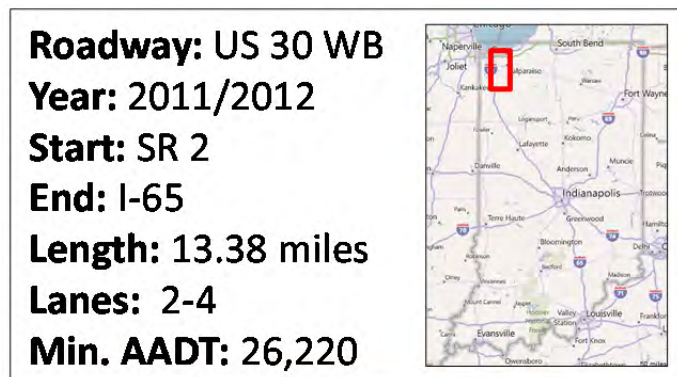
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.45. 2011 &amp; 2012 Eastbound US 30 (I-65 to SR 2): Quarterly travel time summary.



(a) Corridor details

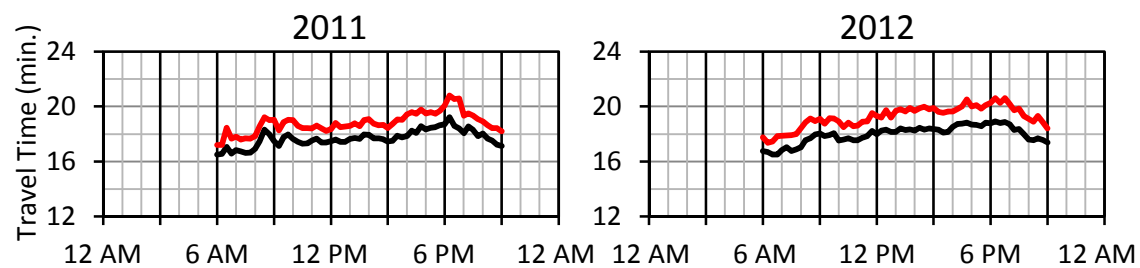
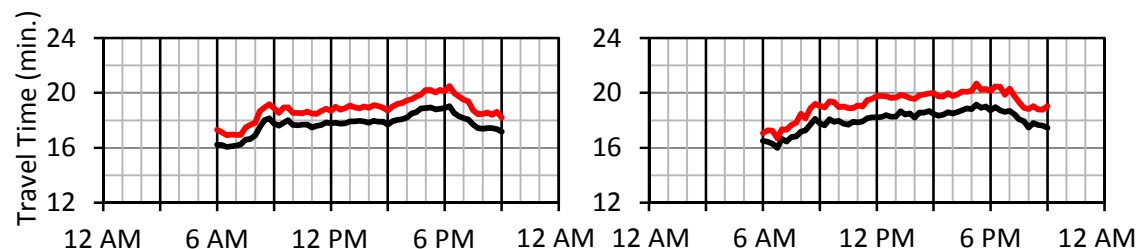
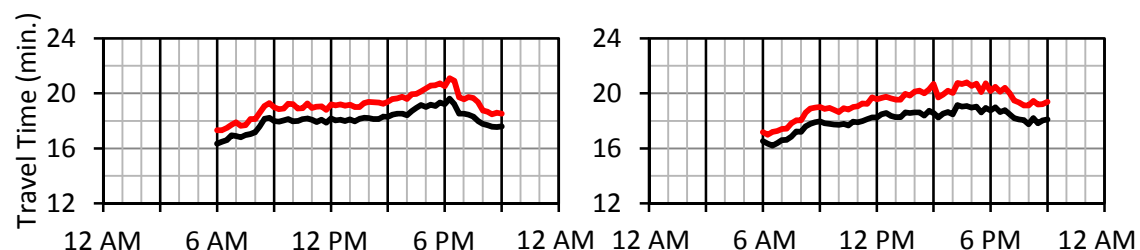
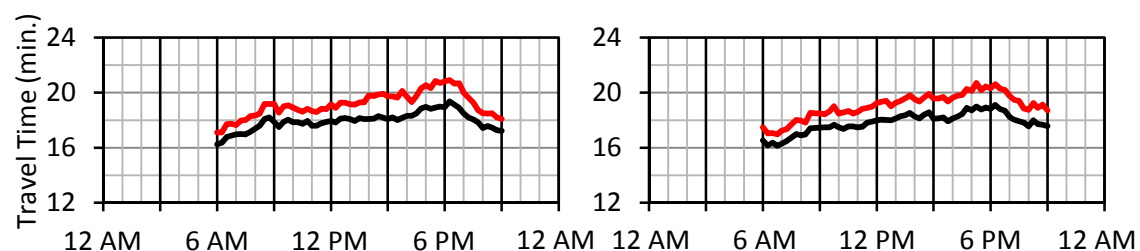
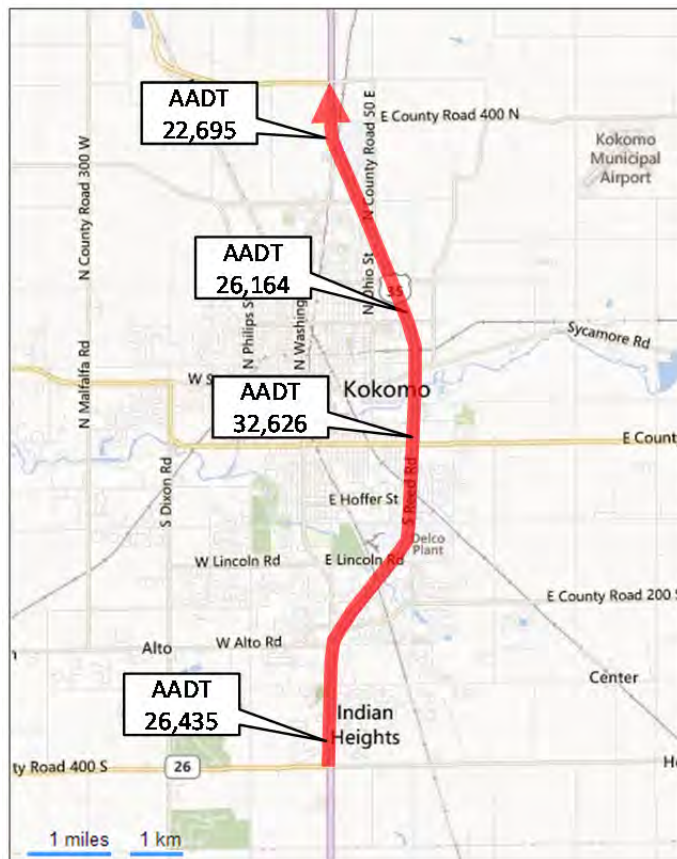
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.46. 2011 &amp; 2012 Westbound US 30 (SR 2 to I-65): Quarterly travel time summary.





(a) Corridor details

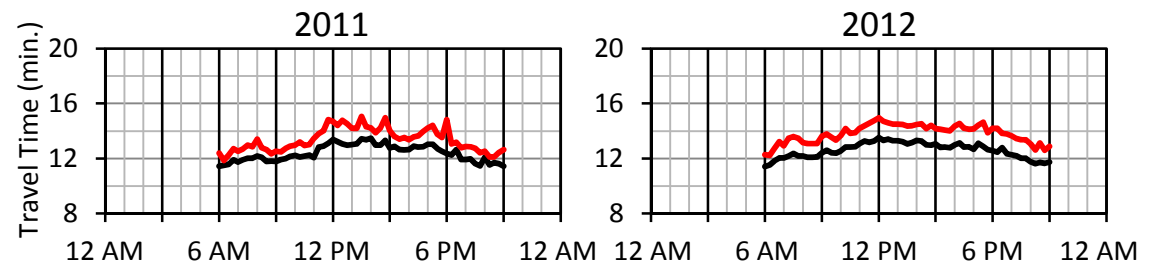
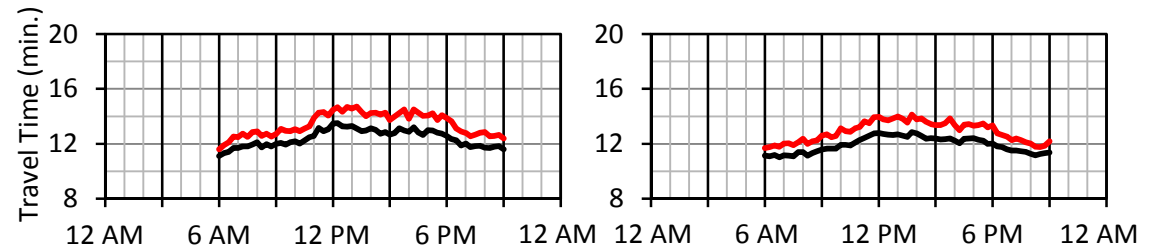
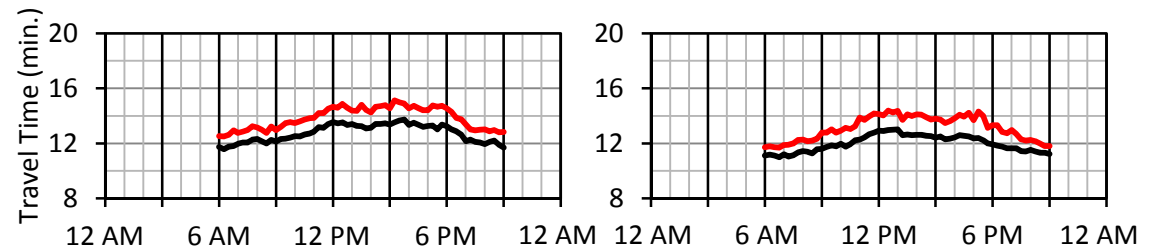
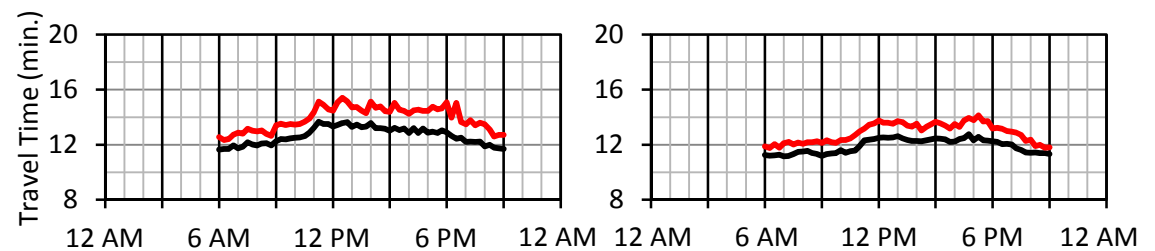
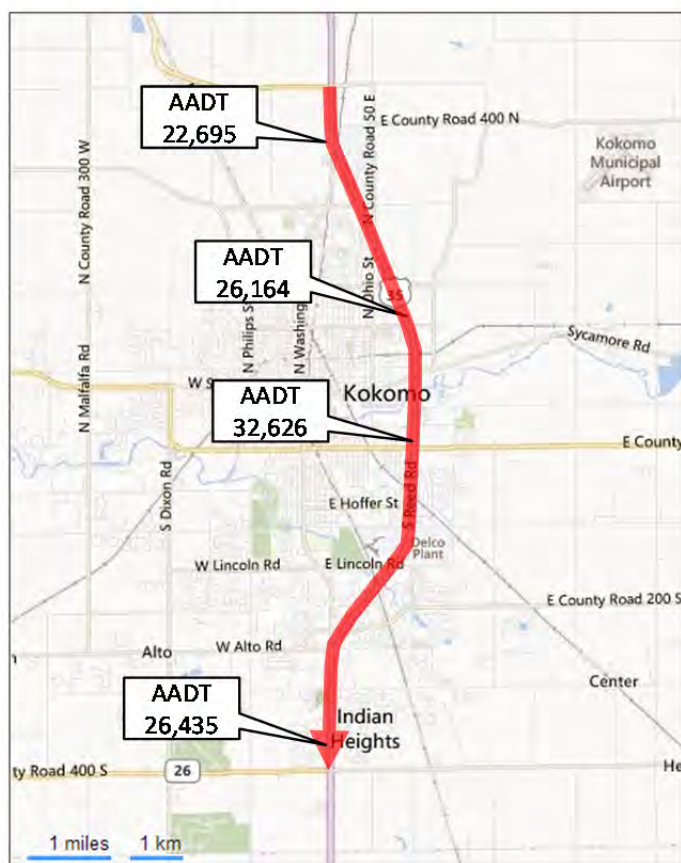
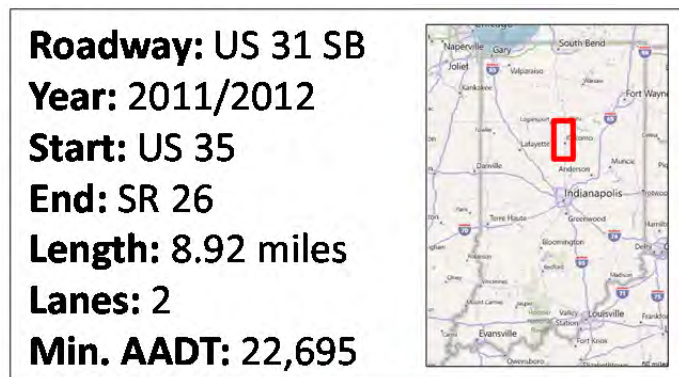
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.47. 2011 &amp; 2012 Northbound US 31 (SR 26 to US 35): Quarterly travel time summary.



(a) Corridor details

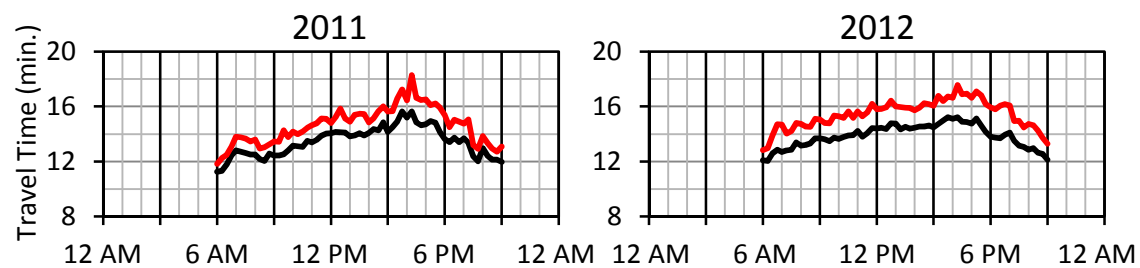
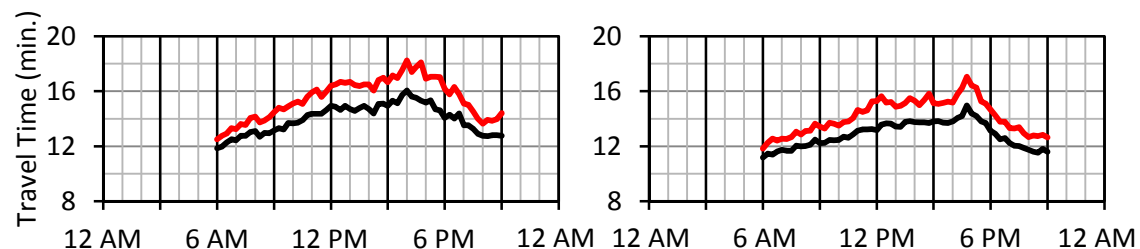
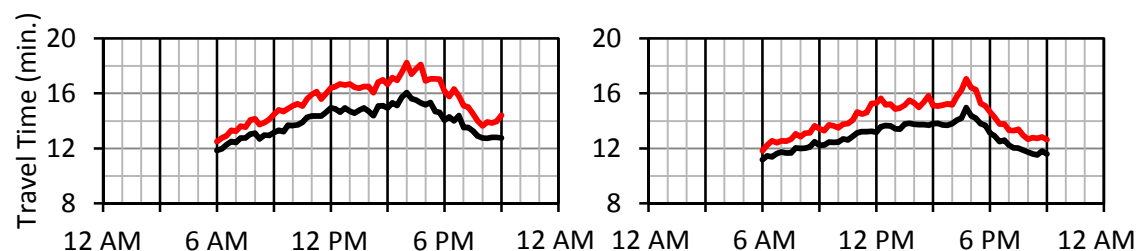
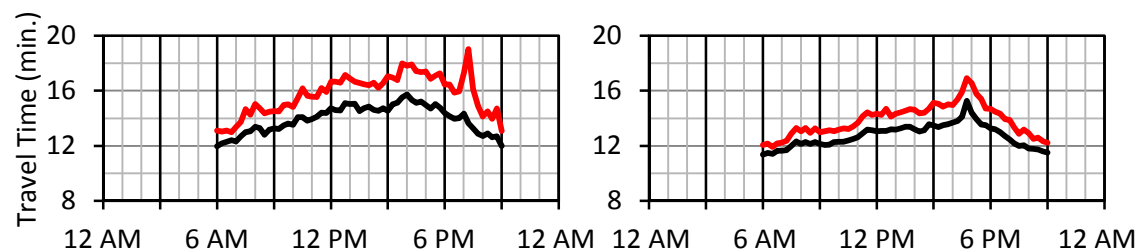
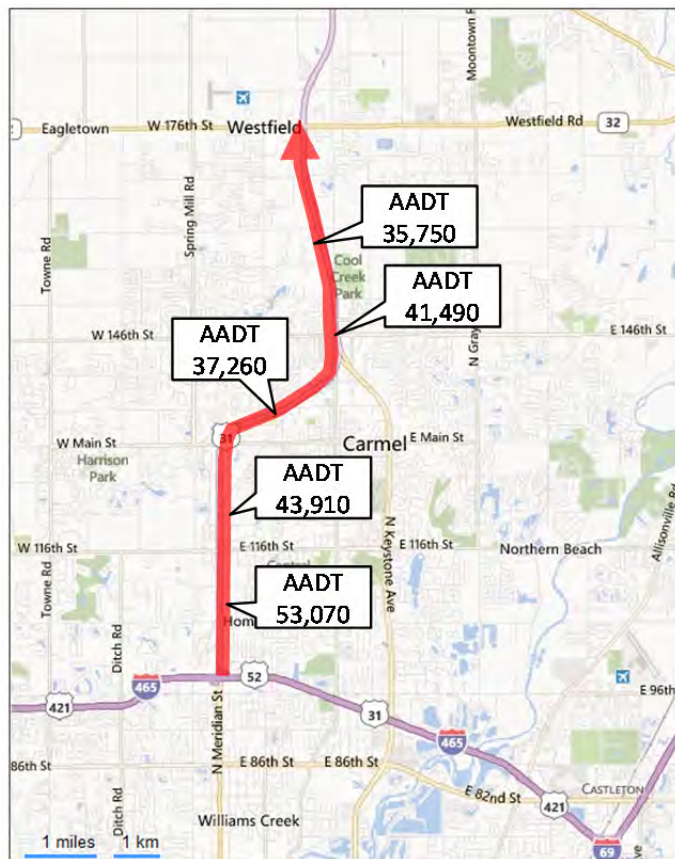
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.48. 2011 &amp; 2012 Northbound US 31 (SR 26 to US 35): Quarterly travel time summary.



(a) Corridor details

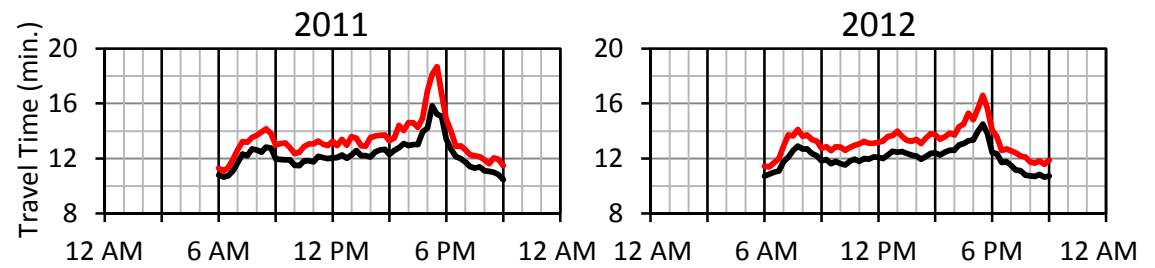
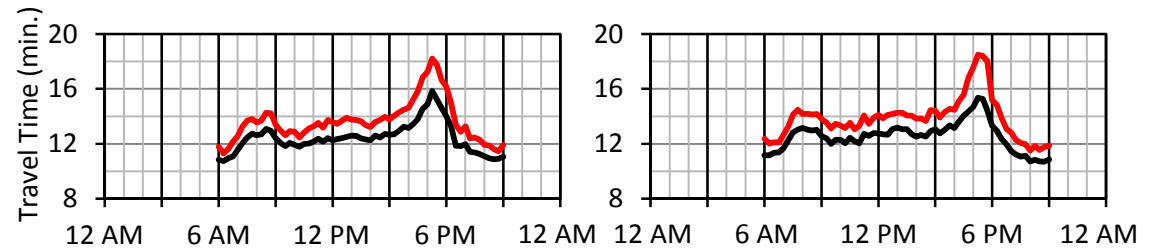
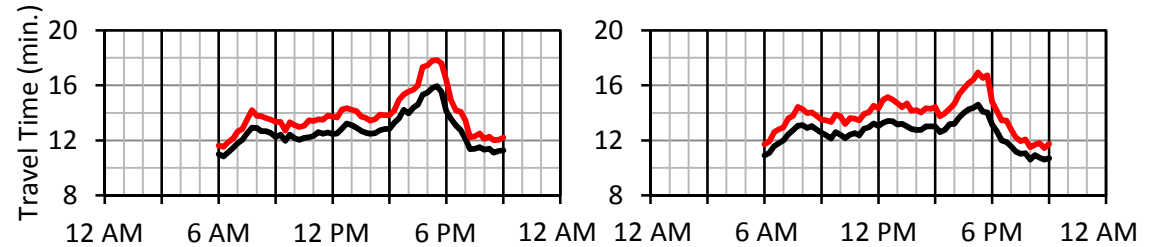
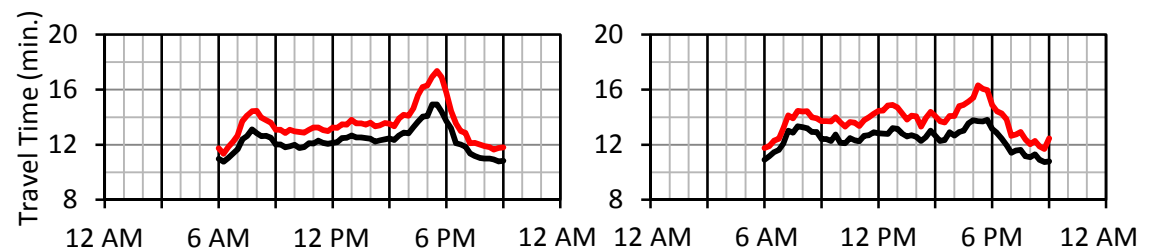
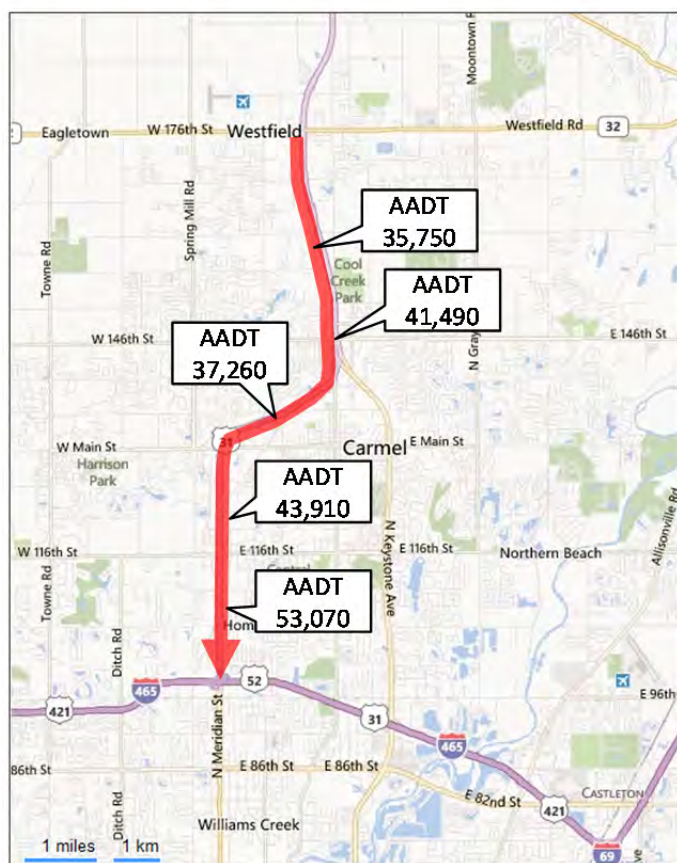
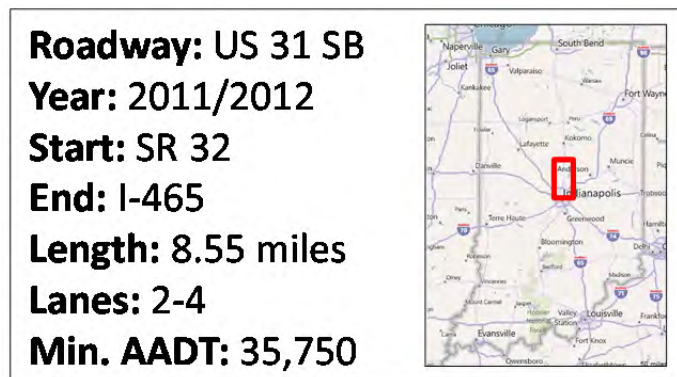
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.49. 2011 &amp; 2012 Northbound US 31 (I-465 to SR 32): Quarterly travel time summary.





(a) Corridor details

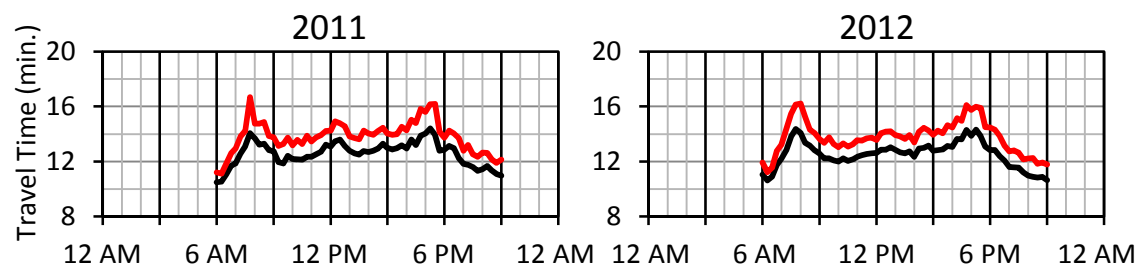
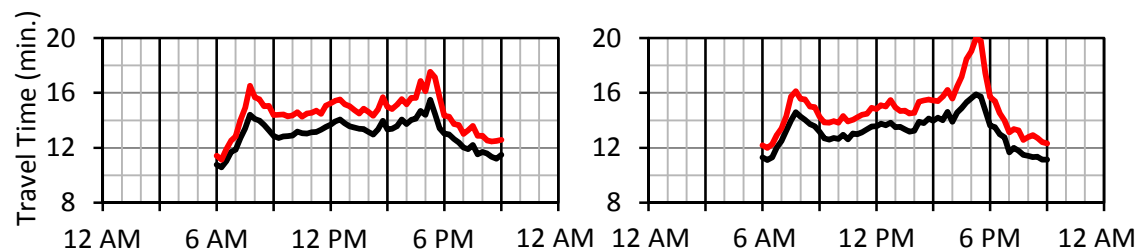
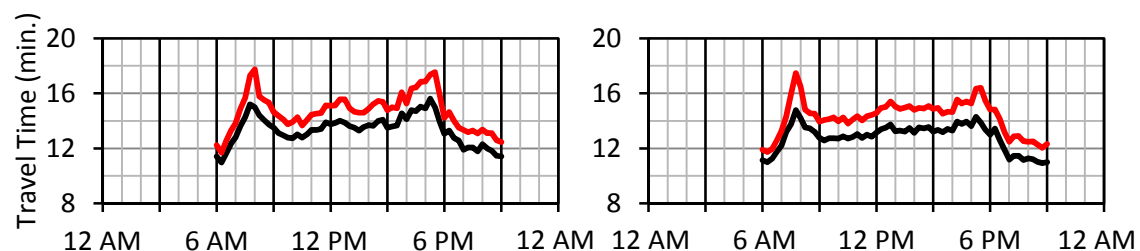
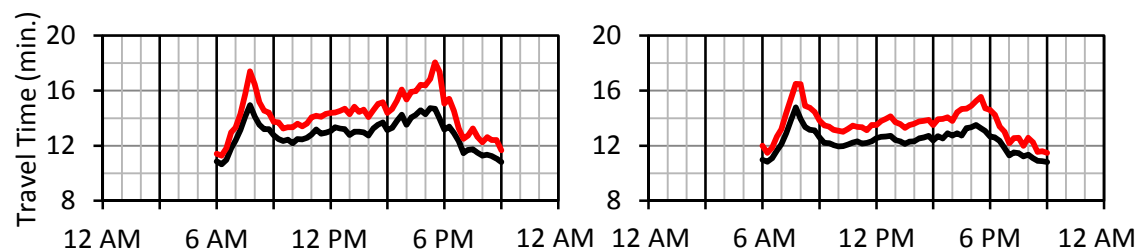
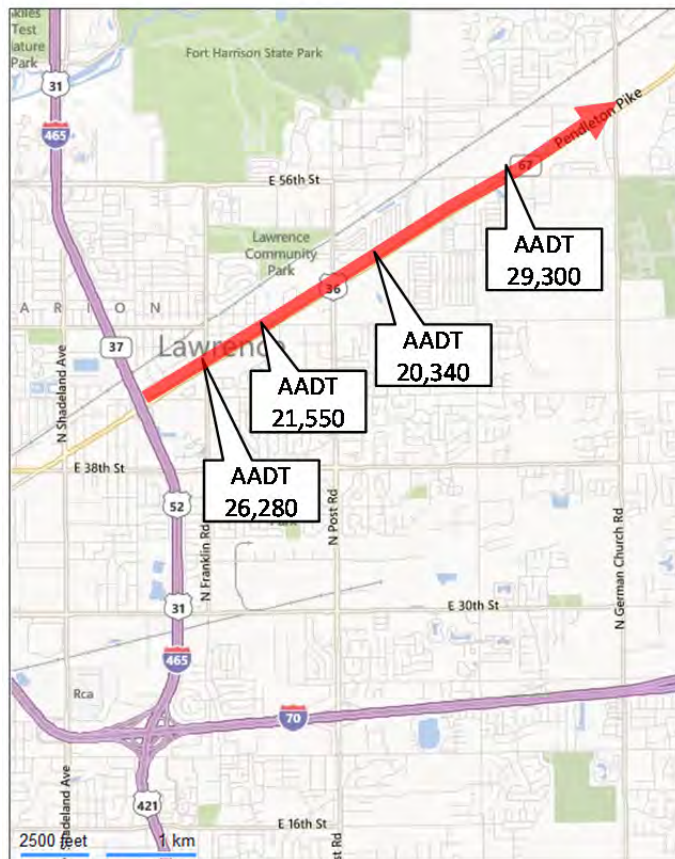
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.50. 2011 &amp; 2012 Southbound US 31 (SR 32 to I-465): Quarterly travel time summary.



(a) Corridor details

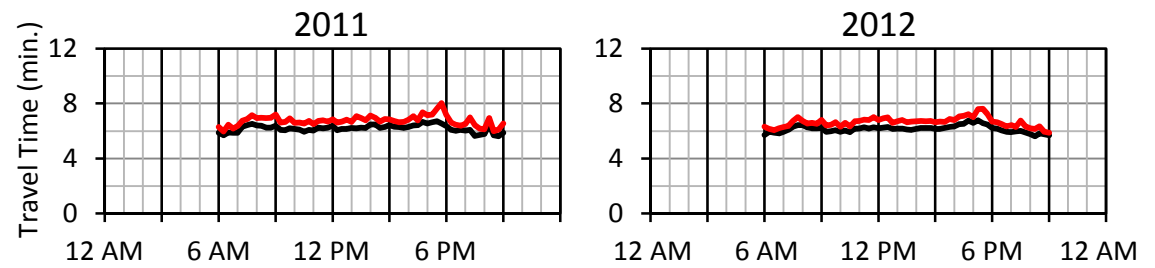
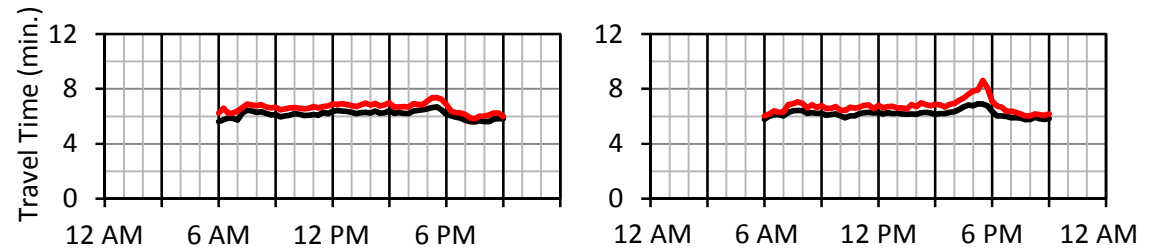
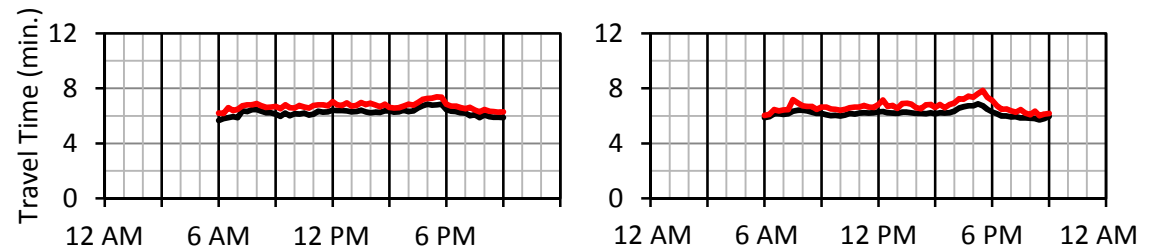
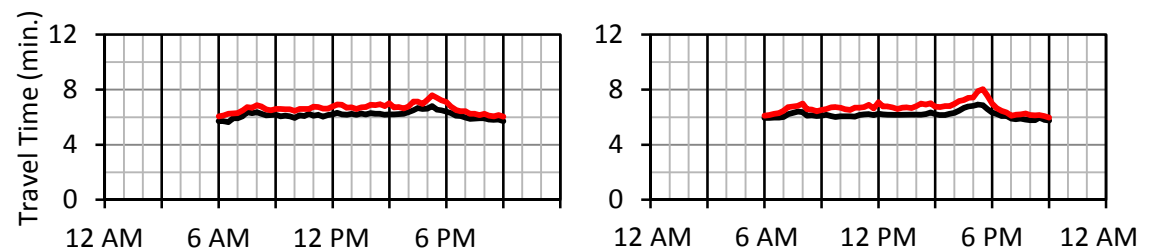
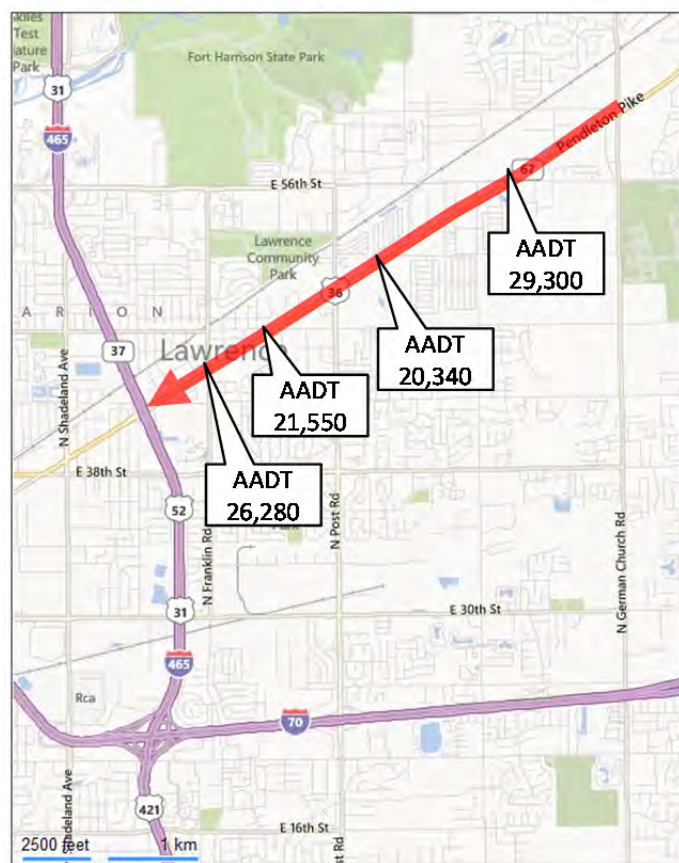
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.51. 2011 &amp; 2012 Eastbound US 36 (I-465 to Pendleton Pike): Quarterly travel time summary.



(a) Corridor details

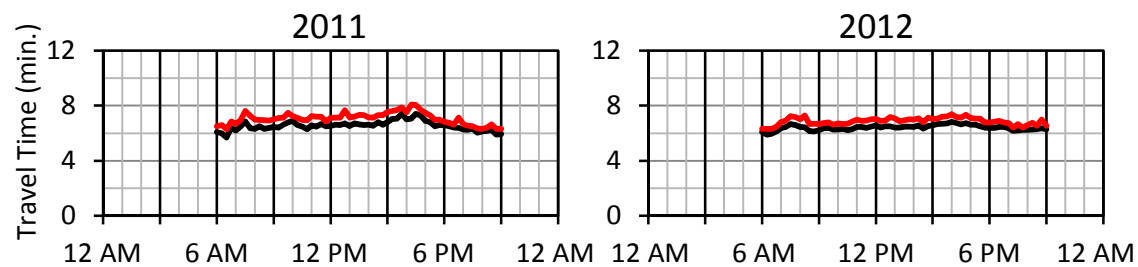
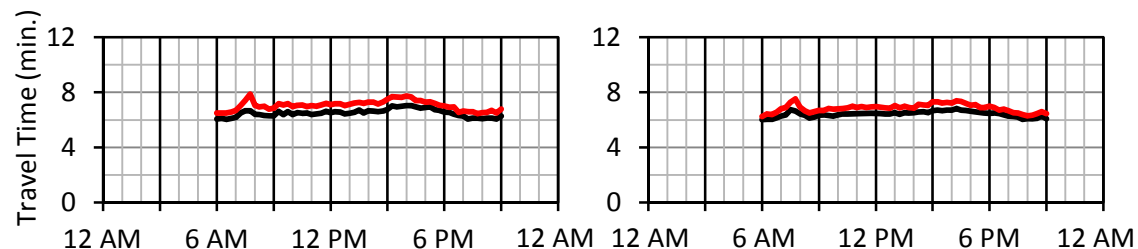
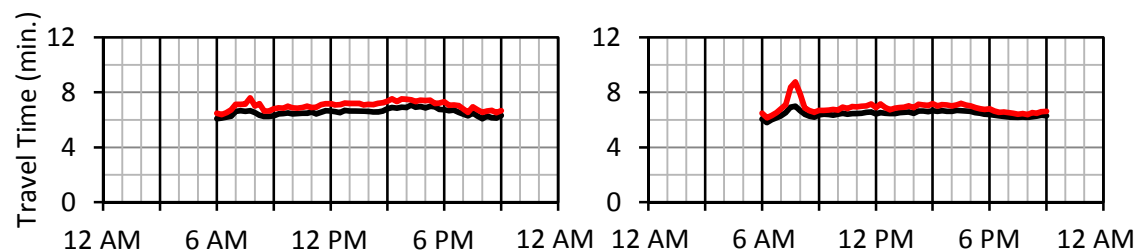
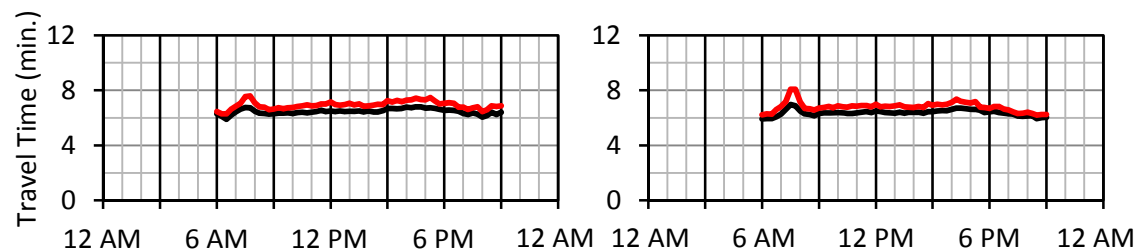
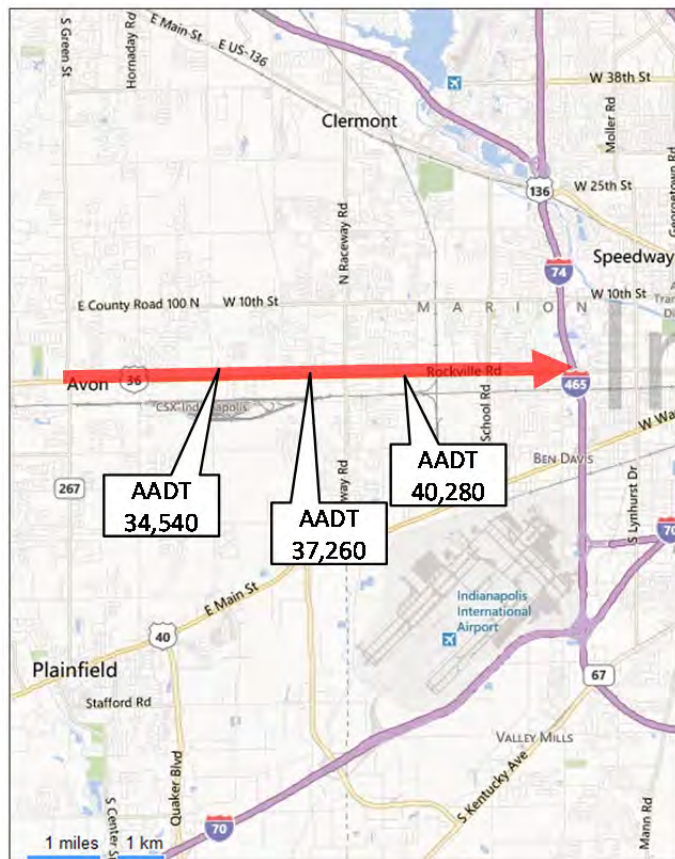
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.52. 2011 &amp; 2012 Westbound US 36 (Pendleton Pike to I-465): Quarterly travel time summary.





(a) Corridor details

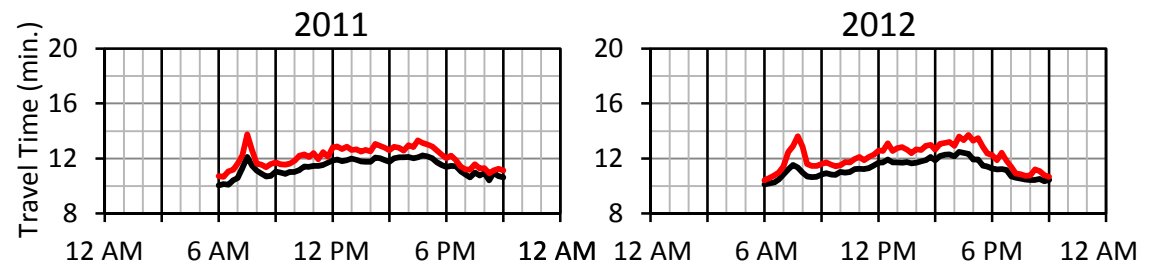
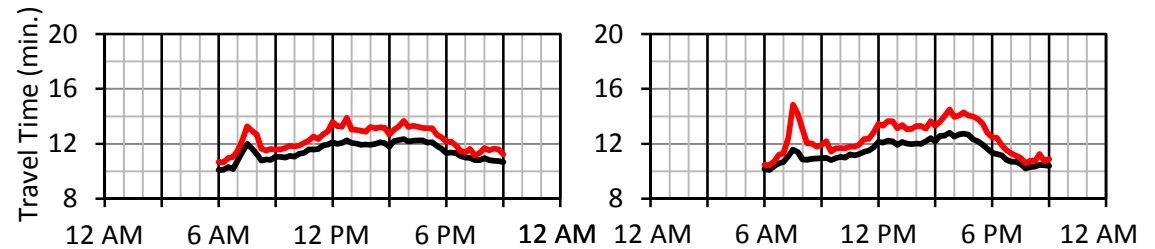
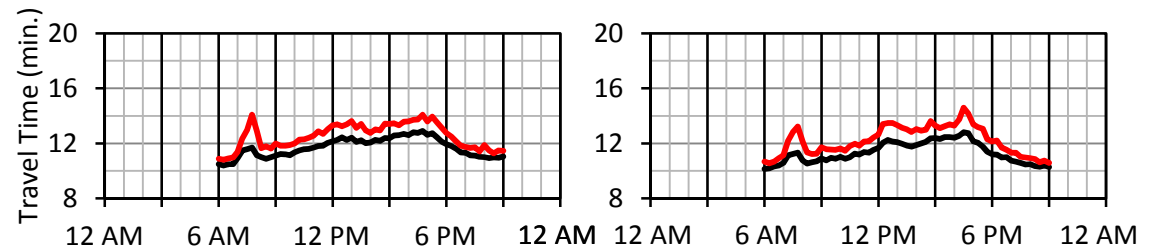
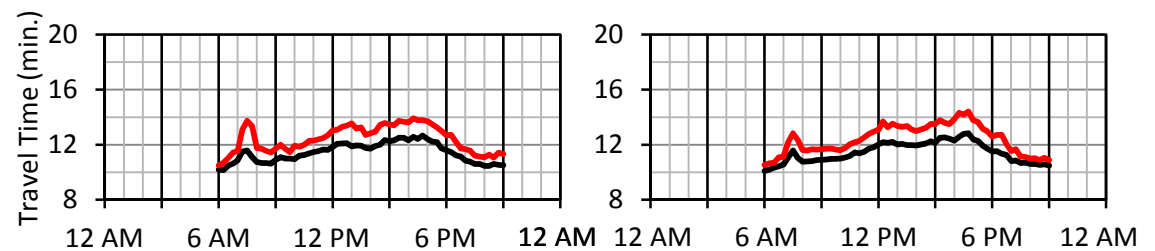
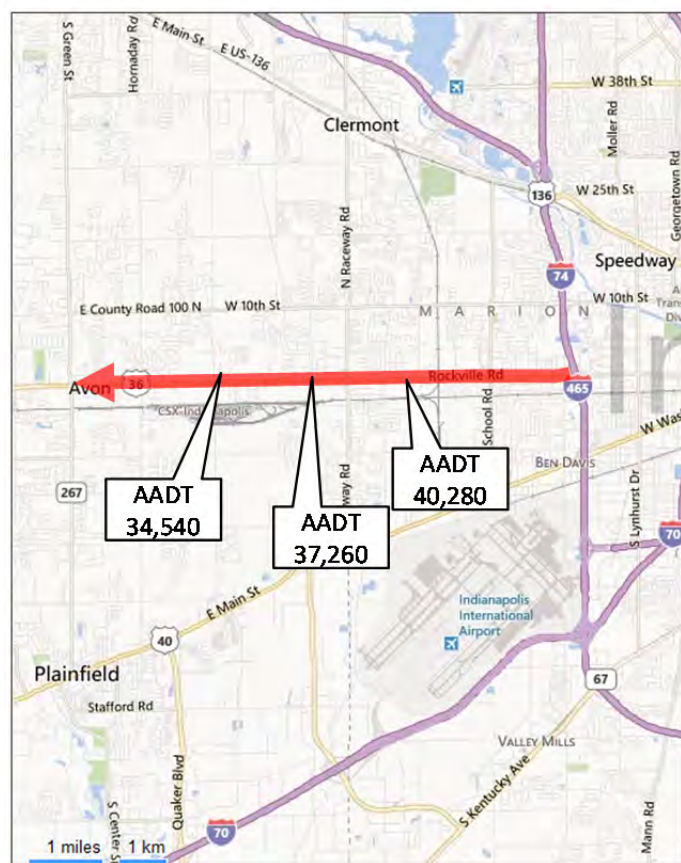
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.53. 2011 &amp; 2012 Eastbound US 36 (SR 267 to I-465): Quarterly travel time summary.

**Roadway:** US 36 WB  
**Year:** 2011/2012  
**Start:** I-465  
**End:** SR 267  
**Length:** 7.03 miles  
**Lanes:** 2-3  
**Min. AADT:** 34,540



(a) Corridor details

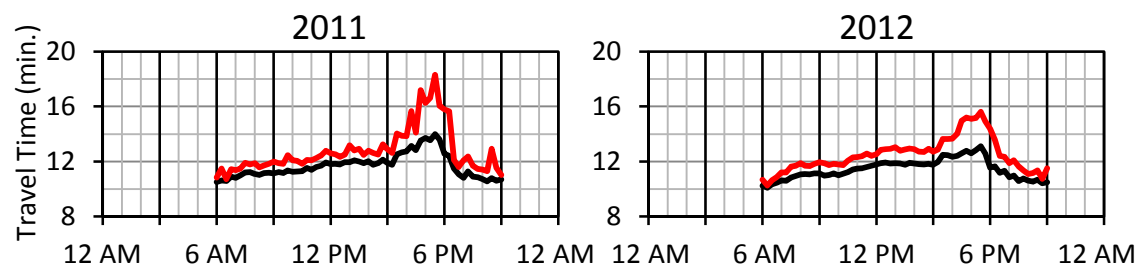
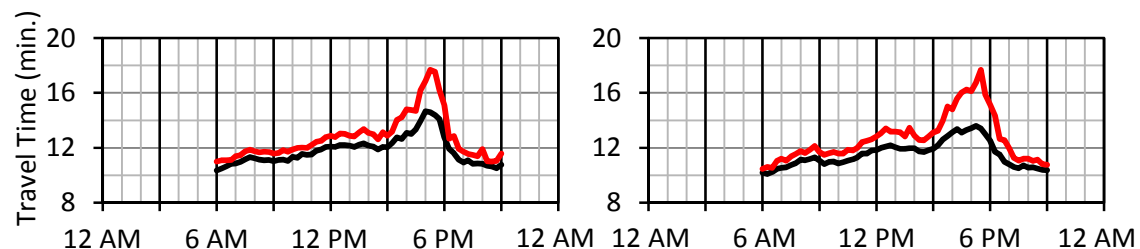
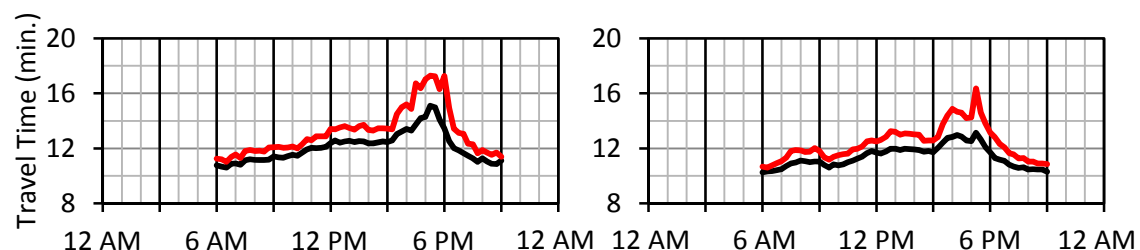
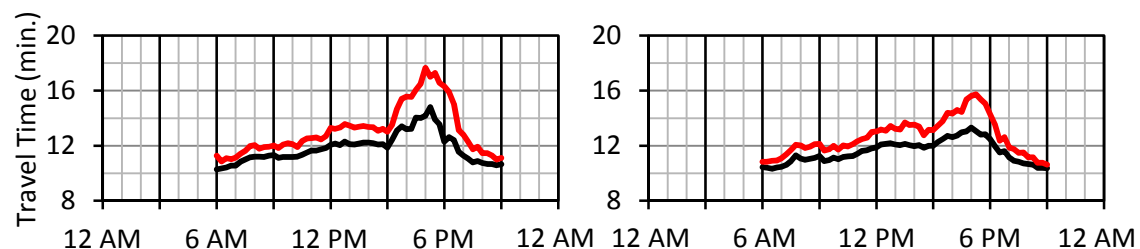
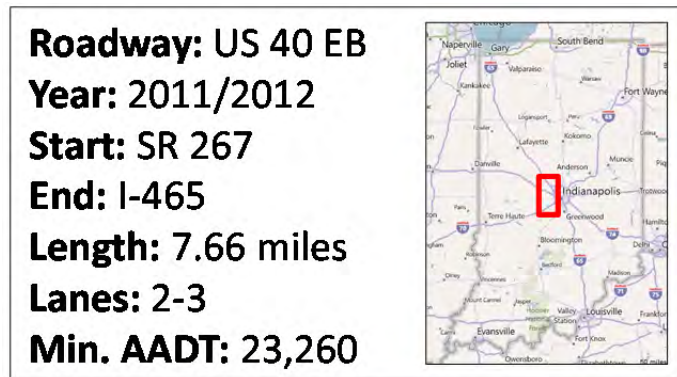
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.54. 2011 &amp; 2012 Westbound US 36 (I-465 to SR 267): Quarterly travel time summary.



(a) Corridor details

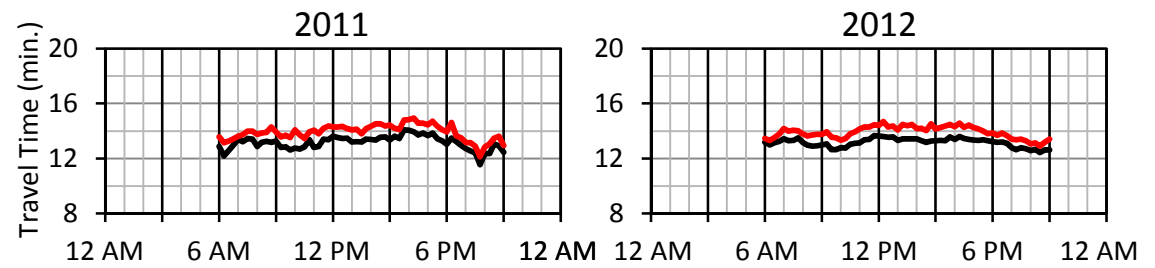
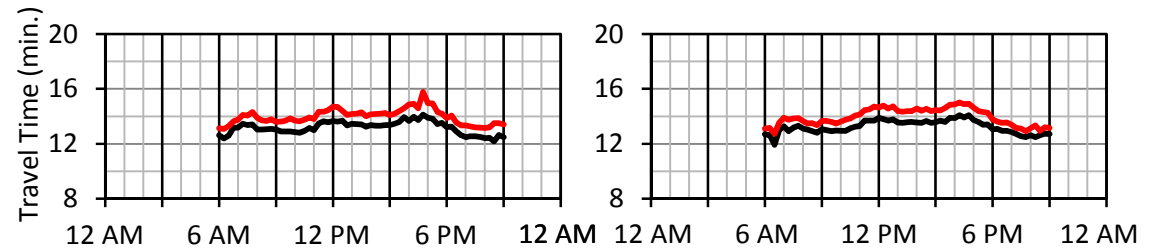
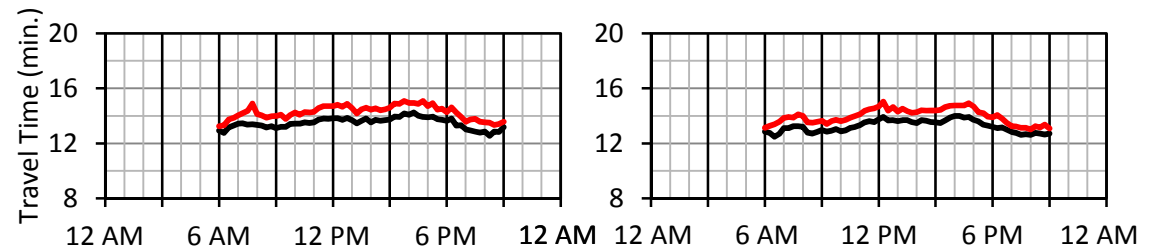
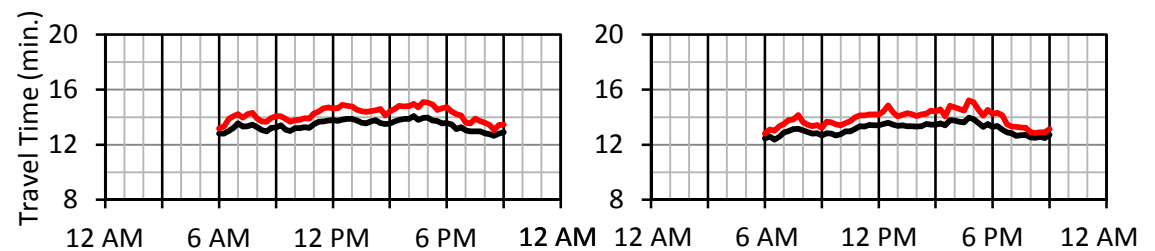
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.55. 2011 &amp; 2012 Eastbound US 40 (SR 267 to I-465): Quarterly travel time summary.





(a) Corridor details

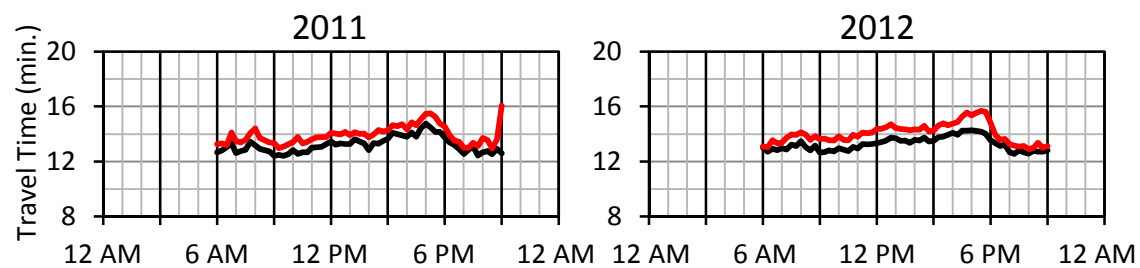
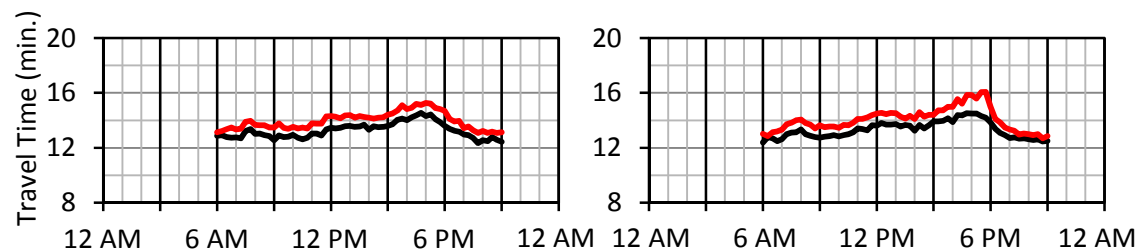
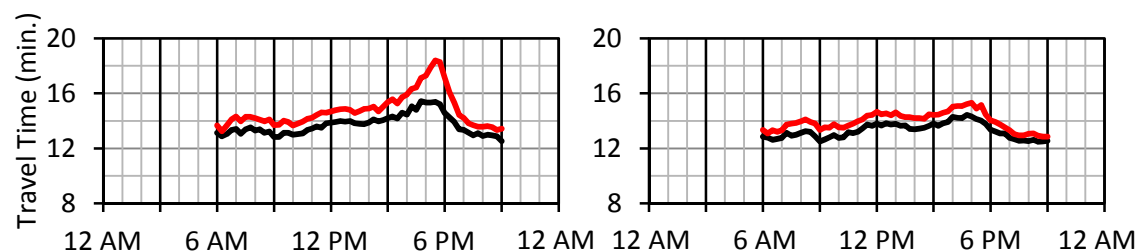
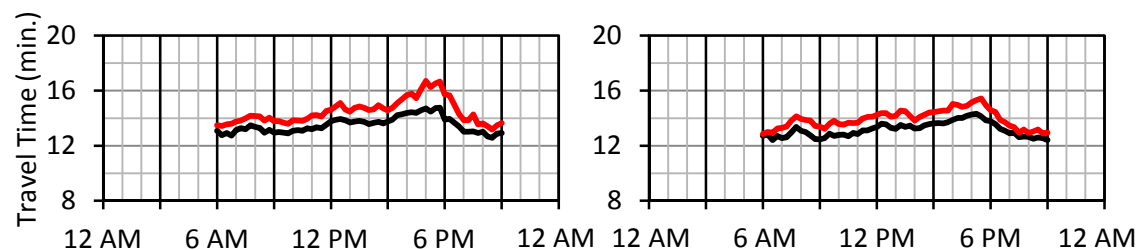
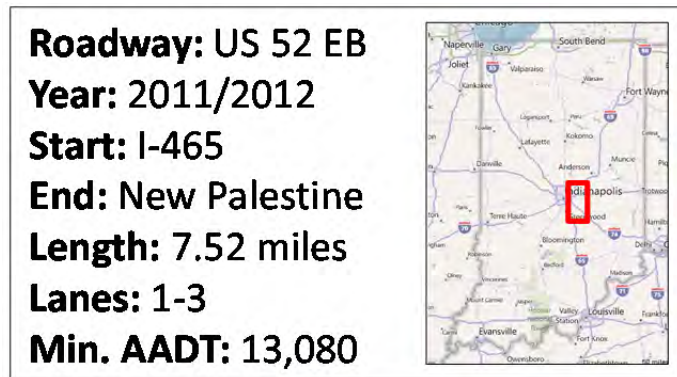
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.56. 2011 &amp; 2012 Westbound US 40 (I-465 to SR 267): Quarterly travel time summary.



(a) Corridor details

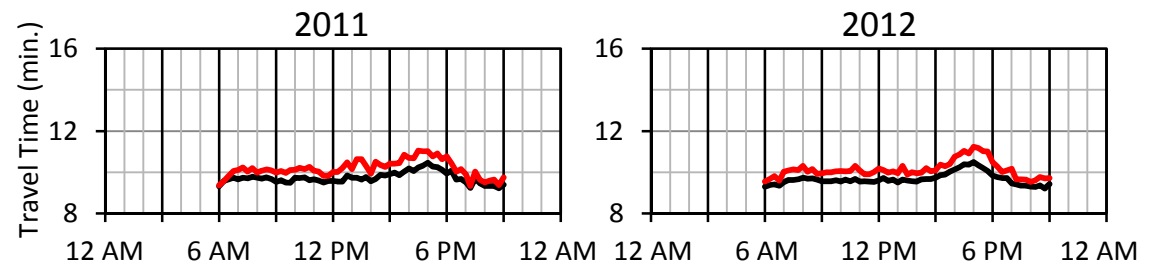
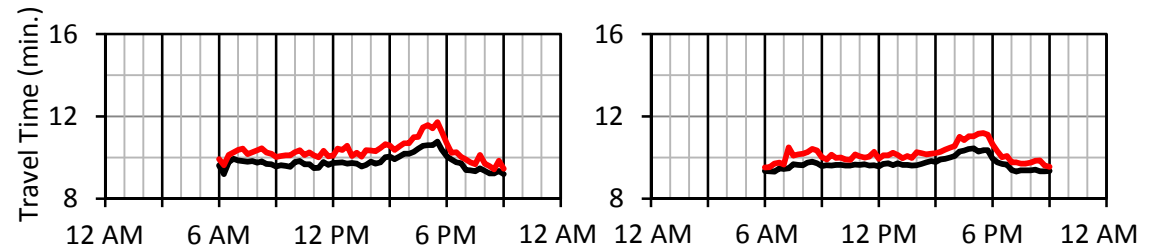
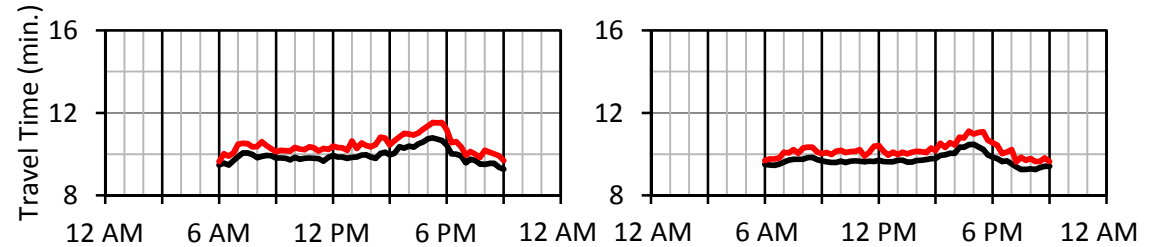
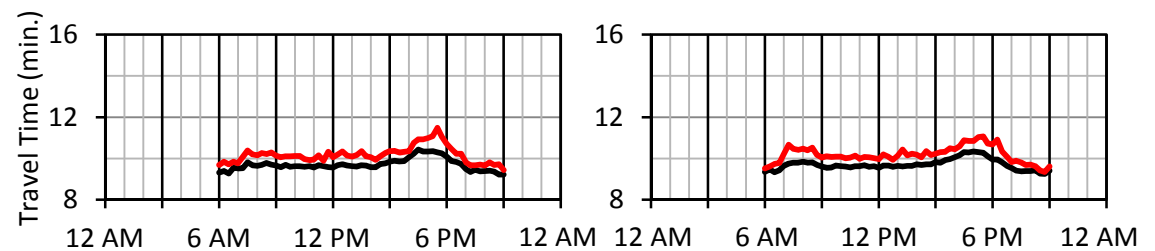
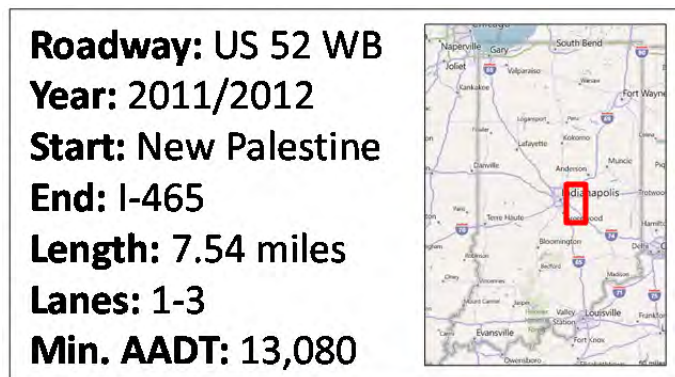
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.57. 2011 &amp; 2012 Eastbound US 52 (I-465 to New Palestine): Quarterly travel time summary.



(a) Corridor details

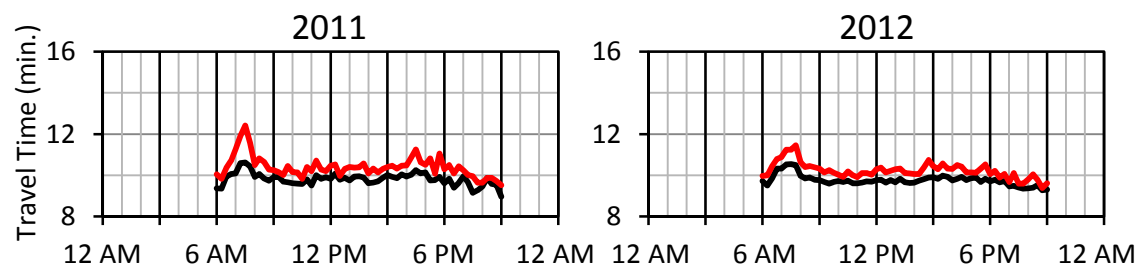
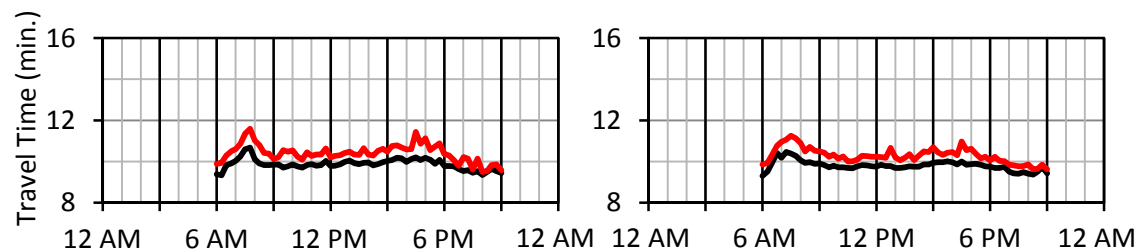
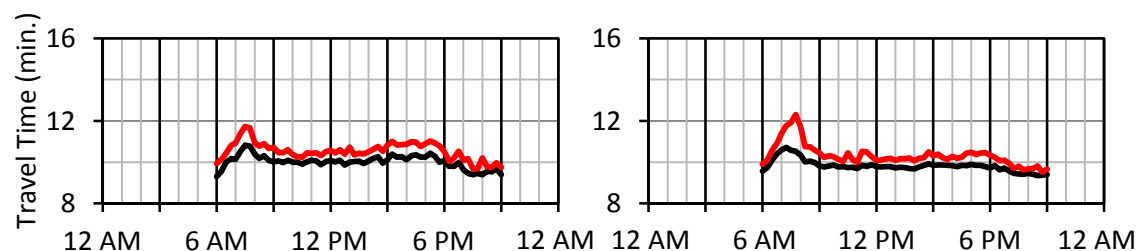
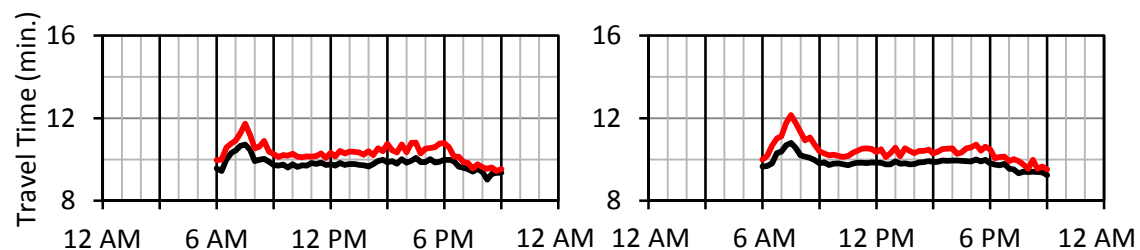
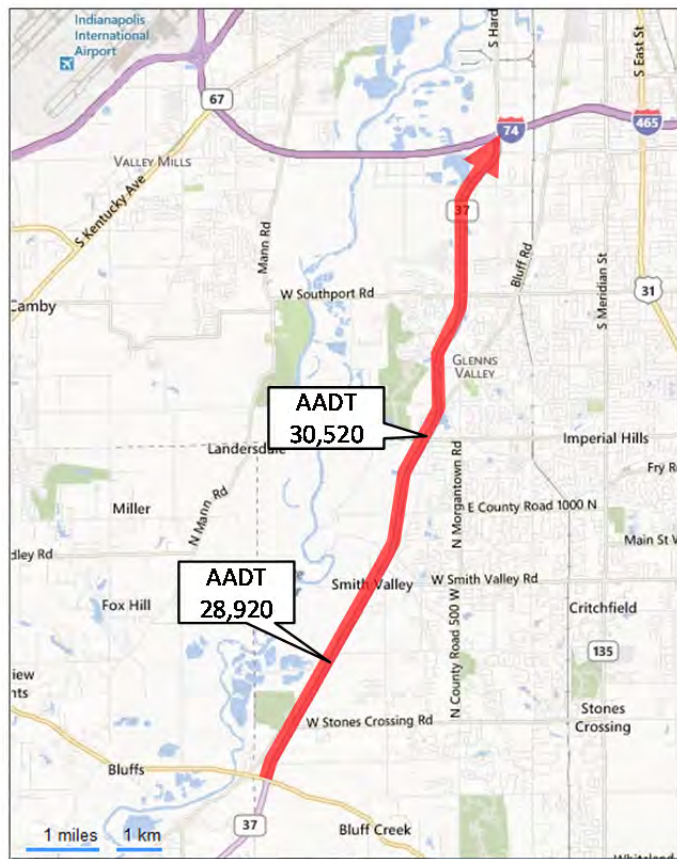
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.58. 2011 &amp; 2012 Westbound US 52 (New Palestine to I-465): Quarterly travel time summary.





(a) Corridor details

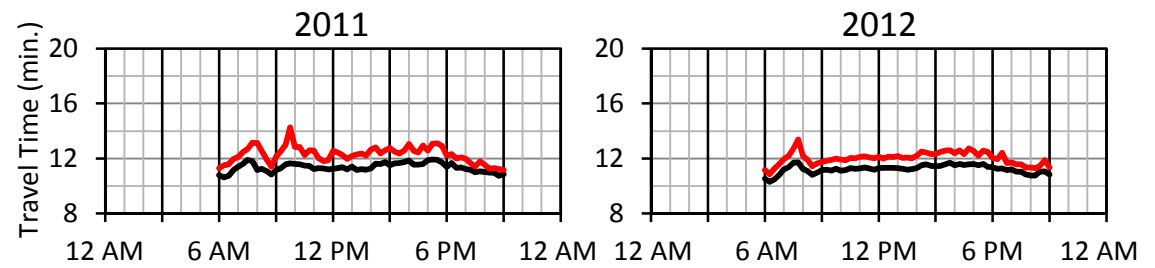
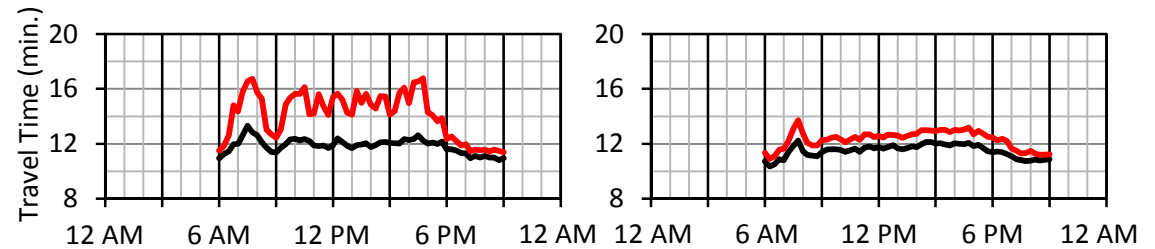
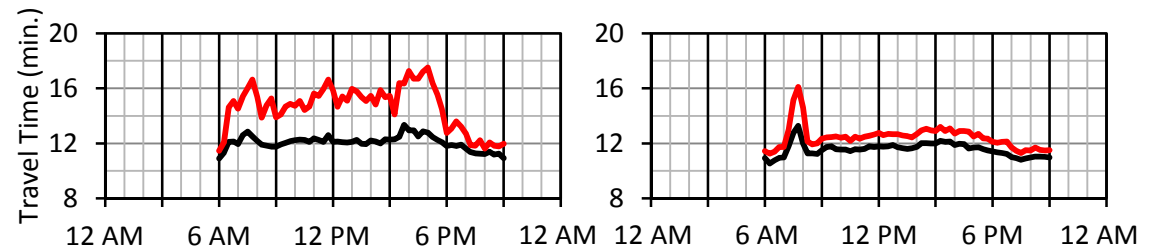
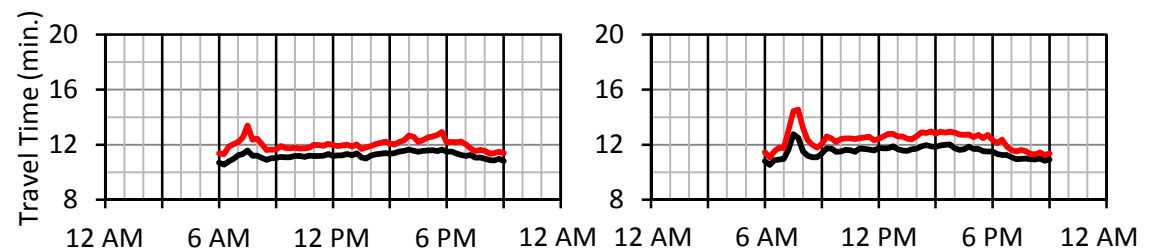
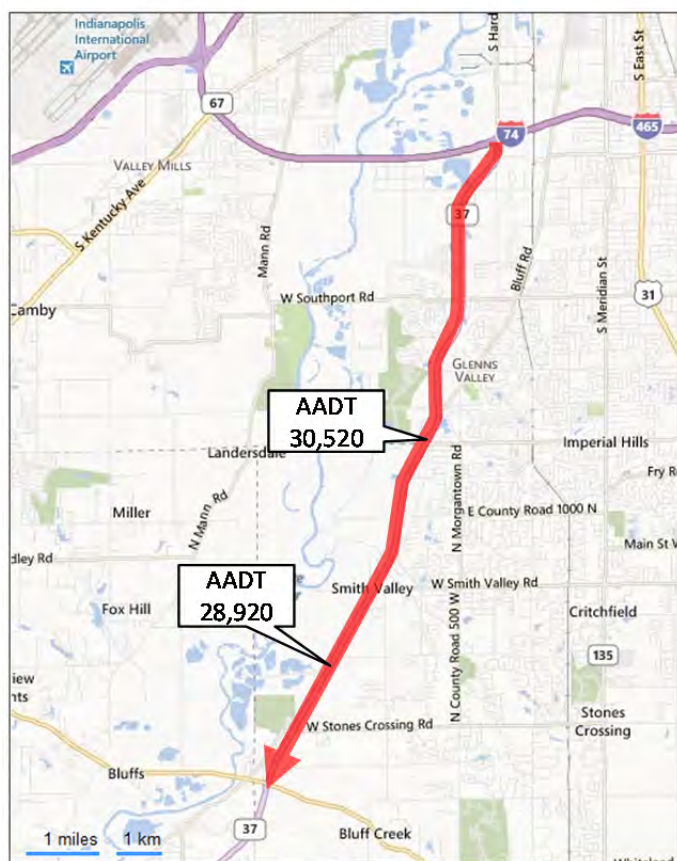
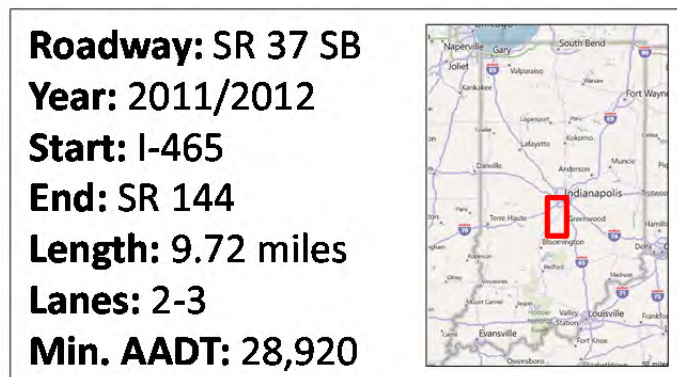
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.59. 2011 &amp; 2012 Northbound SR 37 (SR 144 to I-465): Quarterly travel time summary.



(a) Corridor details

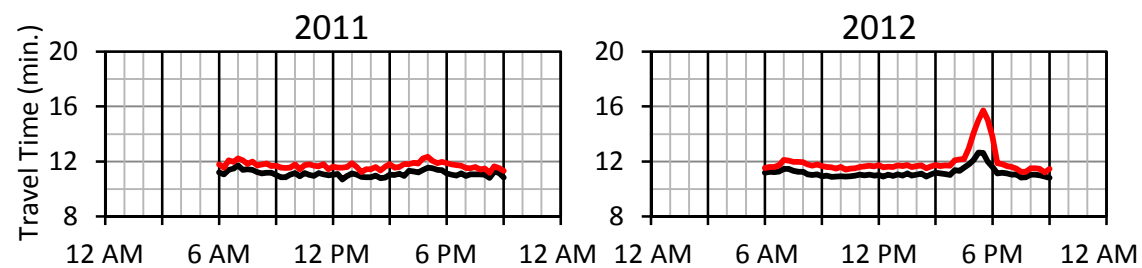
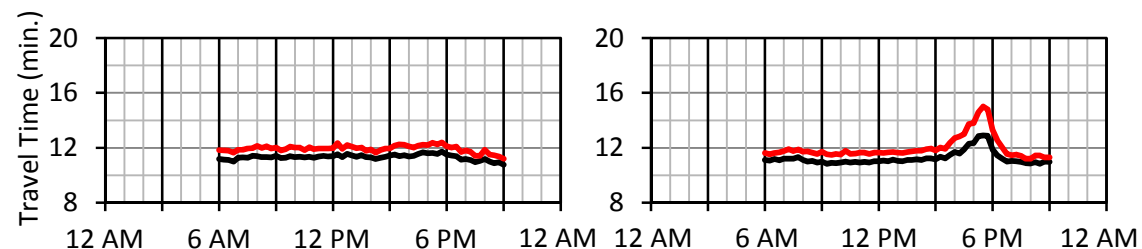
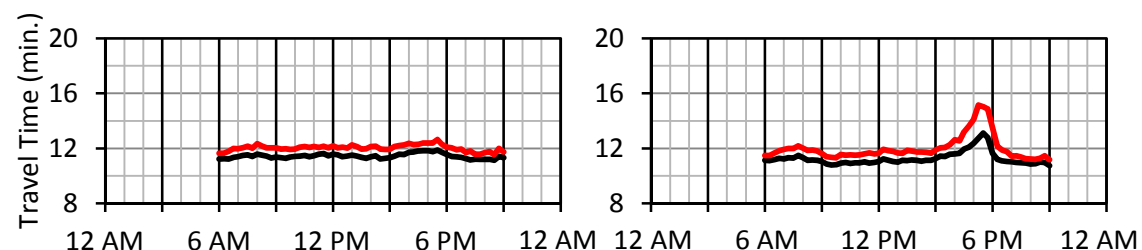
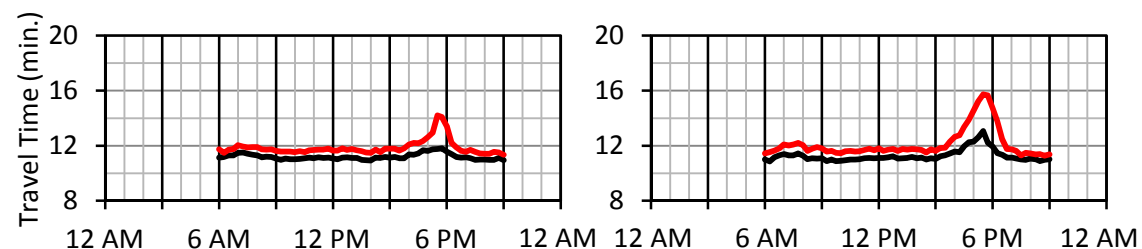
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.60. 2011 &amp; 2012 Southbound SR 37 (I-465 to SR 144): Quarterly travel time summary.



(a) Corridor details

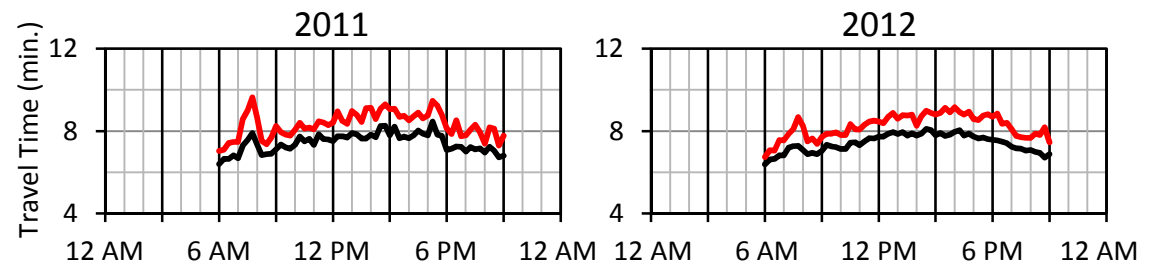
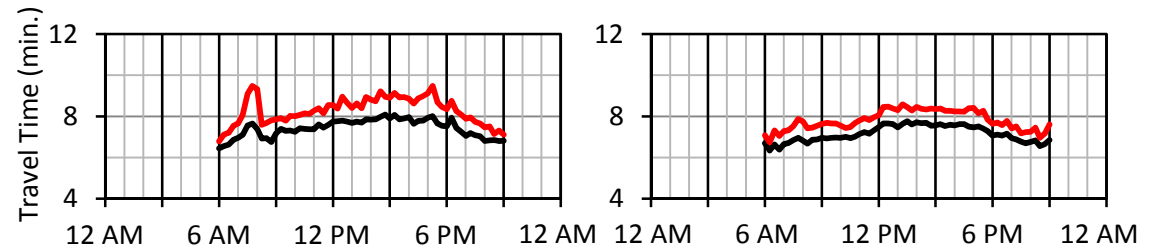
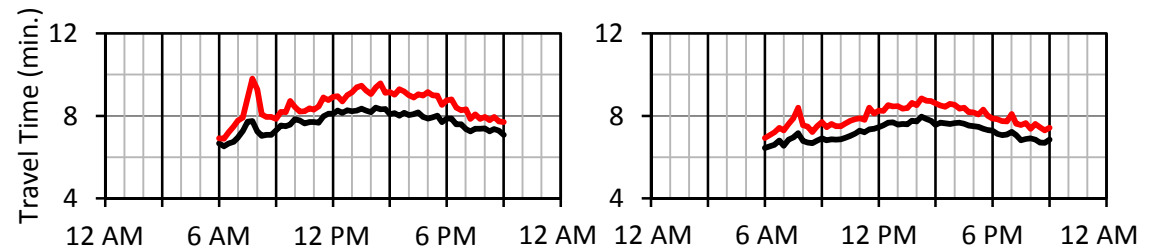
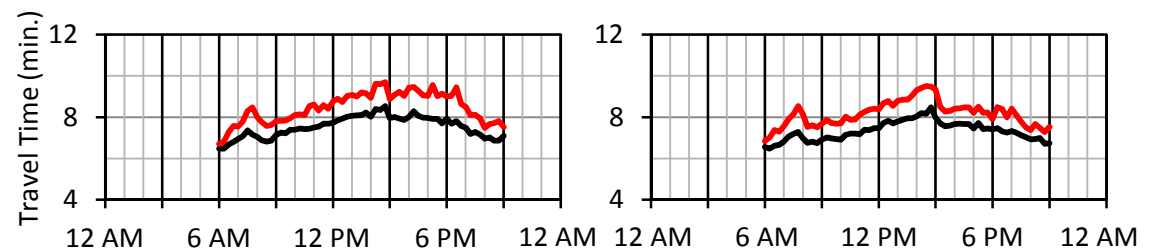
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.61. 2011 &amp; 2012 Northbound US 31 (Greenwood to I-465): Quarterly travel time summary.





(a) Corridor details

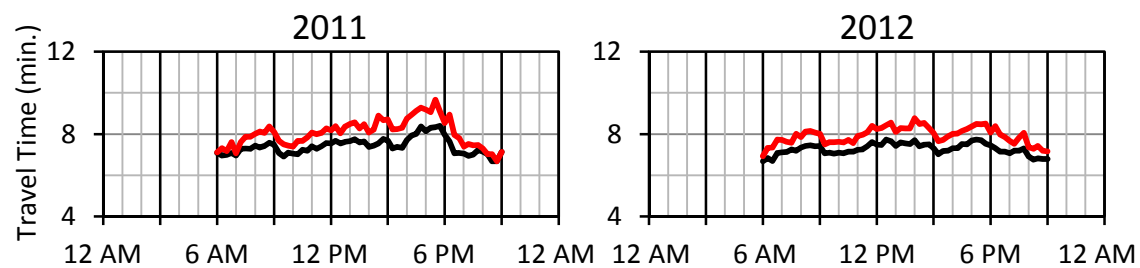
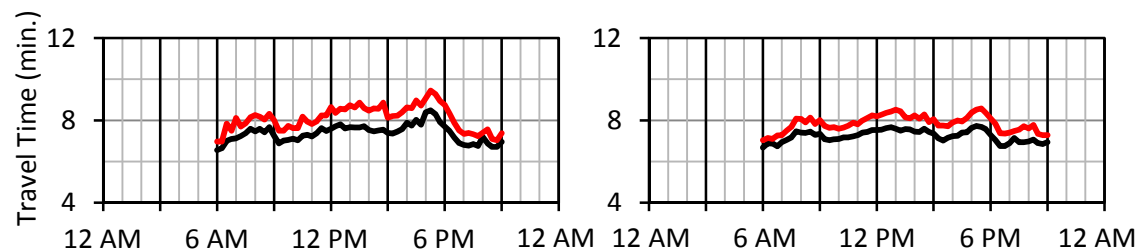
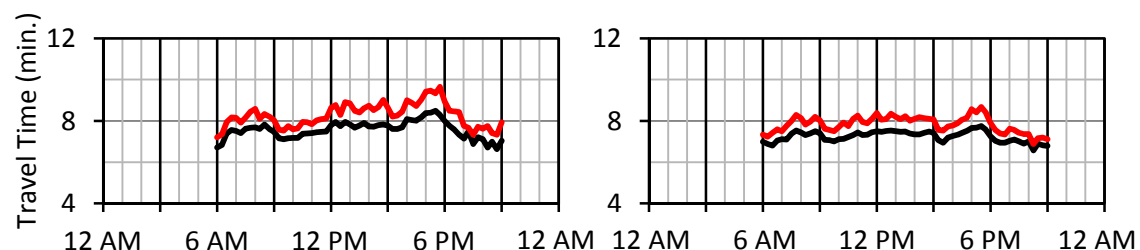
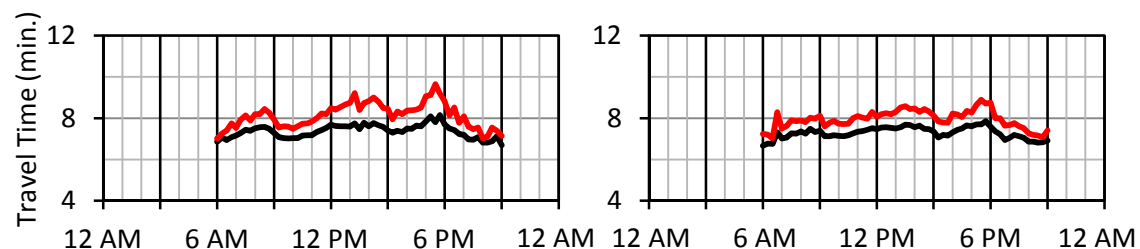
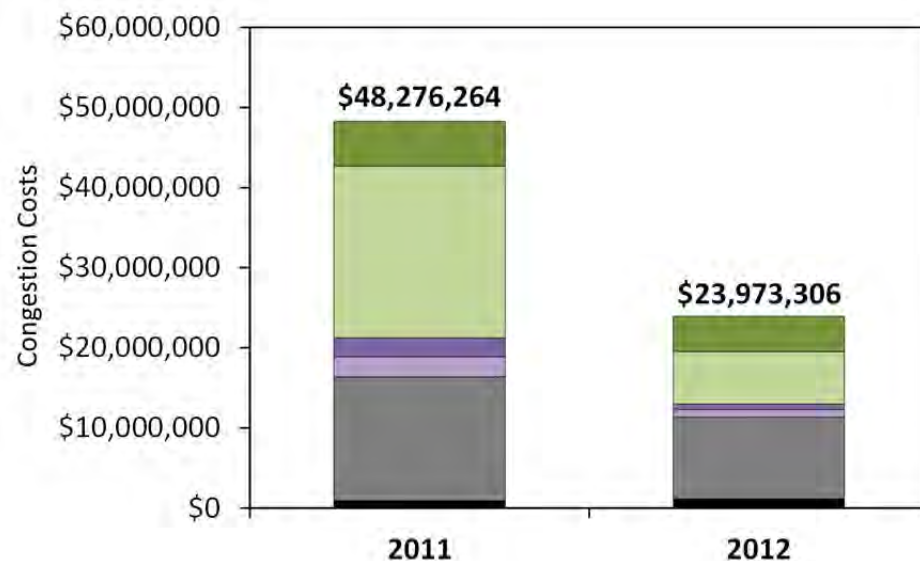
(b) Quarter 1 (Jan.—Mar.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(c) Quarter 2 (Apr.—Jun.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(d) Quarter 3 (Jul.—Sep.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).(e) Quarter 4 (Oct.—Dec.) travel times (50<sup>th</sup> and 85<sup>th</sup> percentiles).

Figure F.62. 2011 &amp; 2012 Southbound US 31 (I-465 to Greenwood): Quarterly travel time summary.

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## Appendix G: Performance Measure Calculation Details



**Summary:** This section summarizes the formulas for the performance measures used in this report. It also includes the formulas used to perform the economic analysis from 2011 to 2012 pictured on the left

- All other segments of Indiana Interstates
- I-94 (MM 0 to MM 46) - WB
- I-94 (MM 0 to MM 46) - EB
- I-465 (MM 8 to MM 18) - OL
- I-465 (MM 8 to MM 18) - IL
- I-65 (MM 0 to MM 16) - SB
- I-65 (MM 0 to MM 16) - NB



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Table G.1. Definition of performance measures introduced in the 2011 *Mobility Report*.

Performance Measure	Definition
<b>Congestion hours</b>	<p>The number of hours during which an interstate segment or series of segments has an average speed of less than 45 mph. This binary performance measure provides performance measure graphics for identifying locations along the interstate with substantial congestion.</p> $CH(S,T) = 0.25 \sum_{i \in S} \sum_{j \in T} \delta_{ij}$
<b>Distance-weighted congestion hours</b>	<p>The number of congestion hours multiplied by the segment length in miles. This performance measure provides summary statistics for the interstate system.</p> $DWCH(S,T) = 0.25 \sum_{i \in S} \sum_{j \in T} \delta_{ij} x_i$
<b>Congestion Index</b>	<p>The total number of congestion hours along an interstate divided by the total length of the interstate, yielding an average congestion hour per mile for the entire roadway.</p> $CH(S,T) = (0.25 \sum_{i \in S} \sum_{j \in T} \delta_{ij}) / \sum x_i$



Table G.2. Definition of performance measures introduced in the 2012 Mobility Report.

Performance Measure	Definition
<b>Speed Profile</b>	The number of congestion hours grouped by speed ranges. These performance measure graphics show both location and severity of congestion along interstate routes.
<b>Speed Deficit</b>	<p>The difference between the 45 mph congestion threshold and the actual observed speed. This is a quantitative performance measure that indexes the severity of congestion.</p> $SD_{ij} = \max(0, v_E - v_{ij})$
<b>Travel Time Deficit</b>	<p>The number of hours of delay occurring in which speeds are below the 45 mph congestion threshold. This measure is useful for calculating the economic impact or user costs of congestion along a route.</p> $TTD(S, T) = \sum_{i \in S} \sum_{j \in T} \left( \frac{1}{v_{ij}} - \frac{1}{v_e} \right) \delta_{ij} x_i$
<b>Congestion Cost</b>	<p>The estimated cost of congestion on a roadway, determined by computing the average delay for a section and multiplying it by the expected traffic volume and the value of time. The proportion of trucks is used to establish congestion costs for commuters and for commercial vehicles. A congestion cost is calculated on segments where the average speed falls 10 mph or more below the posted speed limit.</p> $CC(S, T) = C_{car}(S, T) + C_{truck}(S, T) + C_{CO2}(S, T)$

Table G.3. List of symbols used in economic calculations.

Symbol	Definition
$i$	Index for roadway segment.
$j$	Index for time period
$S$	Section of roadway comprising multiple segments $i$
$T$	Time period comprising multiple time periods $j$
$CH(S, T)$	Congestion hours for section $S$ , time period $T$
$\delta_{ij}$	Indicator of whether the average speed of a given segment for a given time period falls beneath the congestion threshold of 45 mph.
$DWCH(S, T)$	Distance-weighted congestion hours for section $S$ , time period $T$
$x_i$	Distance of segment $i$ (miles)
$SD_{ij}$	Speed deficit for segment $i$ during time $j$
$v_E$	Expected speed (mph)
$v_{ij}$	Observed speed for segment $i$ during time $j$ (mph)
$TTD(S, T)$	Travel time deficit for section $S$ , time period $T$
$CC(S, T)$	Congestion cost for section $S$ , time period $T$
$C_{car}(S, T)$	Congestion cost for commuter vehicles (passenger cars), section $S$ , time period $T$ : $C_{Car}(S, T) = \sum_{i \in S} \sum_{j \in T} v_{ij} D_{ij} (1 - P_{ij}) O_{Car} k_{Car}$
$C_{truck}(S, T)$	Congestion cost for commercial vehicles (trucks), section $S$ , time period $T$ : $C_{Truck}(S, T) = \sum_{i \in S} \sum_{j \in T} v_{ij} D_{ij} P_{ij} O_{Truck} k_{Truck}$
$C_{CO_2}(S, T)$	Congestion cost related to increased CO <sub>2</sub> emissions, section $S$ , time period $T$ : $C_{CO_2} = \sum_{i \in S} \sum_{j \in T} v_{ij} D_{ij} f_{FUEL} f_{PPG} (0.0005 \text{ ton/lb}) k_{CO_2}$
$V_{ij}$	Traffic volume for segment $i$ during time $j$ (total number of vehicles)
$D_{ij}$	Average delay for segment $i$ during time $j$ : $D_{ij} = \max \left[ 0, \frac{x_i}{v_{ij}} - \frac{x_i}{v_E} \right]$
$P_{ij}$	Percentage of commercial vehicles for segment $i$ during time $j$
$O_{Car}$	Occupancy of passenger cars (1.25 passenger per vehicle)
$k_{Car}$	Value of time for passenger cars (\$16.79 per hour)
$O_{Truck}$	Occupancy of trucks (1.00 passenger per vehicle)
$k_{Car}$	Value of time for trucks (\$86.81 per hour)
$f_{FUEL}$	Fuel consumption rate during congestion (0.87 gallons per hour)
$f_{PPG}$	CO <sub>2</sub> generation rate (19.4 pounds per gallon)
$k_{CO_2}$	Value of CO <sub>2</sub> (\$22.00 per ton)

## INDIANA MOBILITY REPORT HISTORY AND AWARDS

In July 2012, the Indiana Department of Transportation (INDOT) published the *2011 Indiana Interstate Mobility Report*, its first statewide mobility report using private sector probe data. In August 2013, INDOT received the Institute of Transportation Engineers 2013 Management & Operations/ITS Council Project Achievement Award for that inaugural report.

## PUBLICATION INFORMATION

The Indiana Mobility Report collection on e-Pubs (<http://docs.lib.purdue.edu/imr/>) was established as a repository for annual mobility reports jointly produced by INDOT and Purdue University. The tools and data described in the annual reports provide a quantitative evaluation of how the Indiana highway system is performing, where opportunities lie for future infrastructure investments, and assessment of mobility when new infrastructure investments are completed. Summary and full versions of the *2011 Indiana Interstate Mobility Report* and the *2012 Indiana Mobility Report* are archived on Purdue e-Pubs and are available for electronic download free of charge. Print versions of these reports are also available for purchase via a link on the download page or through major booksellers.

## Recommended Citations

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Remias, S., T. Brennan, C. Day, H. Summers, E. Cox, D. Horton, and D. Bullock. *2012 Indiana Mobility Report: Full Version*. 2013. doi: 10.5703/1288284315190, ISBN 978-1-62260-257-5.

## CONTACT INFORMATION

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## About the Joint Transportation Research Program (JTRP)

Just over 76 years ago, on March 2, 1937, the Indiana General Assembly passed a resolution that the motto for Indiana would be “The Crossroads of America.” Nine days later, on March 11, 1937, the Indiana General Assembly passed enabling legislation that led to the formation of the Joint Highway Research Project (JHRP) to facilitate collaboration between Purdue University and what was then known as the Indiana State Highway Commission. The Joint Highway Research Program was renamed the Joint Transportation Research Program (JTRP) in 1997 to reflect the state and national efforts to integrate the management and operation of various transportation modes.



The first studies of JHRP were concerned with Test Road No. 1—evaluation of the weathering characteristics of stabilized materials. After World War II, the JHRP program grew substantially and was regularly producing technical reports on a diverse portfolio of transportation-related research projects.

Over 1,500 technical reports are currently available, published as part of the JHRP and subsequently JTRP collaborative venture between Purdue University and what is now the Indiana Department of Transportation. Free online access to all reports is provided through a unique collaboration between JTRP and Purdue Libraries. These are available at <http://docs.lib.purdue.edu/jtrp>. Since 2006, there have been over 600,000 downloads of these reports worldwide.

Further information about JTRP and its current research program is available at <http://www.purdue.edu/jtrp>.

**Top.** Construction of new  
Interstate 69 near Petersburg,  
Indiana (Sept. 2012).

**Bottom.** Completed  
Interstate 69 (May 2013).

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